Chapter 2
Public Participation, Existing Development and Alternatives

2.1 INTRODUCTION

The purpose of this chapter is to provide an overview of the public participation process, to describe the existing wellfield development in the PAPA, and to present Alternatives for continued exploration, development, and production of natural gas resources in the PAPA. The project components associated with Alternative A (No Action Alternative), Alternative B (Proposed Action Alternative), and Alternatives C, D, and E are summarized in this chapter. Other project Alternatives considered, but not analyzed in detail, are also discussed in this chapter. This chapter describes the expansion of transportation corridors and proposed gas sales pipelines from the PAPA to gas processing plants in southwest Wyoming.

2.2 PUBLIC PARTICIPATION

2.2.1 Scoping, Consultation and Coordination

NEPA regulations (40 CFR §1500-1508) require that the BLM use a scoping process to identify potential significant issues in preparation for impact analysis. The principal goals of scoping are to allow public participation to identify issues, concerns, and potential impacts that require detailed analysis. Scoping was the primary mechanism used by the BLM to initially identify issues regarding proposed development in the PAPA.

BLM held meetings with participation from various agencies, the Proponents, and the public to encourage early and improved public participation and agency cooperation. The BLM's Notice of Intent (NOI) to prepare a Supplemental EIS inviting the public to comment on the Proponents' proposal for long-term development of the PAPA appeared in the *Federal Register* on October 21, 2005. BLM mailed a scoping notice to the media, governmental agencies, environmental organizations, industry representatives, individuals, landowners, and livestock grazing permittees. The scoping notice explained the general nature of the proposal and requested comments. The public scoping comment period ended November 20, 2005. Scoping meetings were held in Jackson and Marbleton on November 7, 2005, and in Pinedale on November 8, 2005.

The locations of the proposed transportation corridor/pipeline alignments were not determined at the time of the initial scoping; therefore, an additional scoping notice was issued. The second notice, mailed on April 14, 2006, was sent to the same recipients as the October 2005 scoping notice, as well as to individuals and organizations on mailing lists associated with BLM's RSFO and KFO. The public comment period for the second scoping notice ended on May 17, 2006.

Numerous issues were identified in the scoping process. Comments received during scoping were incorporated into the analysis in the Draft SEIS published in December 2006 (BLM, 2006a). Scoping comments are available for inspection in BLM's PFO, RSFO, and KFO. The agencies and government entities that were consulted during the scoping process include the U.S. Fish and Wildlife Service (USFWS), USFS, National Park Service (NPS), U.S. Environmental Protection Agency (EPA), State of Wyoming (including WGFD and WDEQ), Sublette County, and the BLM Interdisciplinary Team (ID Team). The scoping issues identified are summarized in Section 2.2.2 and detailed in Appendix 2.

The ID Team considered all comments received during the scoping process (see Appendix 2). From the breadth of key environmental issues submitted by agencies and the public, the ID Team developed the Alternatives that were described and analyzed in the Draft SEIS (BLM, 2006a). Alternatives included in this Revised Draft SEIS include those analyzed in the Draft SEIS as well as two additional Alternatives that are based on comments received on the Draft SEIS.

2.2.2 Summary of Issues

Following the November 2005 scoping, BLM received a total of 63 written comments, nine of which were from government agencies (two federal, five state, and two county), four from industry representatives, five from environmental organizations, and 45 from private individuals. Following the April 2006 scoping of the proposed transportation corridor/pipeline alignments, BLM received a total of 10 written comments. Of the comments received, five were from government agencies (three federal, one state, and one county) and five were from private individuals.

Issues introduced by the public, industry, interested groups, and other agencies are summarized below:

- The pace of development in the PAPA is too fast and BLM has not fully evaluated the environmental consequences of winter drilling, operators' mitigation, compliance with all regulatory standards, and application of Adaptive Management.
- The BLM should analyze an alternative that emphasizes conservation and wildlife in the PAPA.
- The impact to wildlife by current development has been a major concern. Although monitoring must continue, new approaches to mitigation should be developed and monitored.
- The effects on livestock operators and private landowners by wildlife displaced due to development in the PAPA should be evaluated both on- and off-site, and mitigation should be proposed.
- Winter drilling will increase winter traffic and increase safety risks.
- The effect of winter drilling on the long-term economic stability of Sublette County should be evaluated.
- Industrialization on public and private lands has become a single resource use of land, not multiple use.
- Hunting is impacted by declining wildlife populations.
- Wellfield development is impacting surface water and groundwater.
- Air quality in the region should be fully evaluated with respect to sensitive airsheds and local air quality, and mitigation measures should be proposed, where necessary.

2.2.3 Comment Period on the Draft SEIS

The Draft SEIS (BLM, 2006a) was available for public comment in December 2006. The public comment period initially ran for 60 days from December 15, 2006 through February 13, 2007. A Supplemental Ozone Analysis was released in early February 2007, and the public comment period was extended to April 6, 2007.

Over 57,000 comments were received on the Draft SEIS (BLM, 2006a) citing various rationales either in support of or in opposition to various Alternatives. The BLM received substantive

comments from business and industry representatives; environmental groups; federal, state, and local agencies; and individuals about the Alternatives and many suggested that additional Alternatives be considered. Based upon these suggestions, the BLM formulated two additional Alternatives and made changes to the Draft SEIS resulting in this Revised Draft SEIS. The major changes are:

- The affected environment has been updated to include current baseline data and to include development that occurred in 2006;
- Two additional Alternatives (Alternative D and Alternative E) are analyzed;
- Additional Proponent-committed mitigation is included in Alternative D; and
- Additional discussion of impacts to socioeconomic, air quality, and wildlife resources based on a range of drilling rigs operating in the PAPA at any one time is included (Appendix 3).

2.3 EXISTING DEVELOPMENT IN THE PAPA

Many of the written responses to scoping as well as comments received on the Draft SEIS (BLM, 2006a) referred to issues about existing development in the PAPA. The extent of existing development in the PAPA, combined with the allowed components in the PAPA ROD (BLM, 2000b) provides the baseline for evaluating each Alternative described in Section 2.4. The analyses and discussions that follow provide a current inventory of natural gas development in the PAPA since the PAPA ROD was issued.

In addition to the extent of development, scoping and Draft SEIS (BLM, 2006a) comments focused on the pace of development in the PAPA. For this analysis, the number of wells drilled and completed during any given year has been defined to be the pace of development.

There were 38 producing wells at the end of 2001, the first full year after the PAPA ROD was issued. At the end of 2006, there were approximately 642 producing wells (613 since the PAPA ROD). Natural gas production in 2006 was approximately 27 times greater than production in 2000, (Table 2.3-1 and Figure 2.3-1). Condensate and water production have also increased by similar proportions each year.

Table 2.3-1
Total Annual Production of Natural Gas, Condensate, and Produced Water in the PAPA since 2000[1]

Year	Natural Gas (MCF)	Condensate (Bbls)	Produced Water (Bbls)
2000	10,587,252	100,405	175,912
2001	21,701,861	210,127	336,447
2002	61,747,523	550,857	809,927
2003	109,864,089	881,926	1,950,380
2004	180,398,607	1,424,753	3,712,832
2005	237,909,623	1,869,043	5,069,538
2006	284,789,614	2,201,685	6,384,655

[1] Source: WOGCC, 2007.

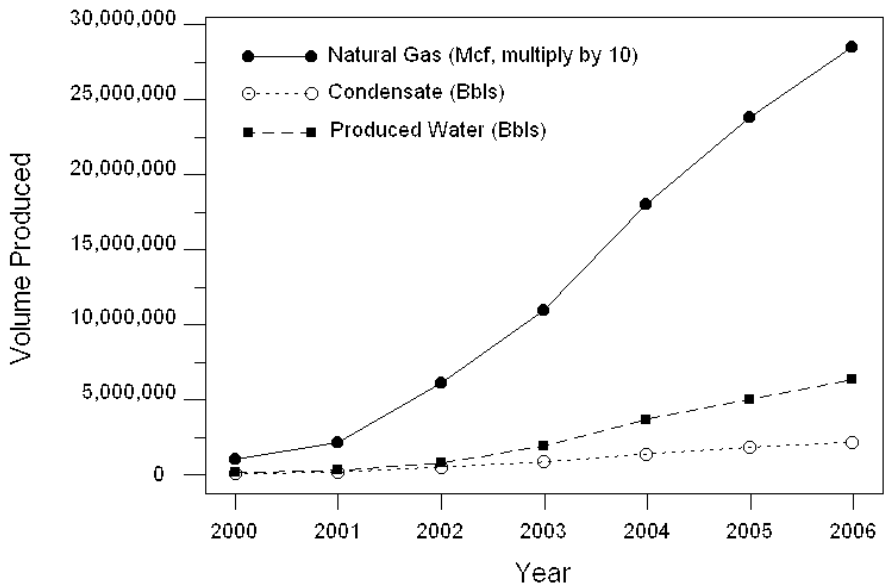


Figure 2.3-1
Total Annual Production of Natural Gas, Condensate, and Produced Water in the PAPA since 2000
(Source: WOGCC, 2007)

Since approval of the PAPA ROD (BLM, 2000b), better definition of the resource places the Pinedale Anticline Field as the third largest natural gas field in the nation (WOGCC, 2007).

2.3.1 Limitations in the PAPA ROD

2.3.1.1 Project Components

The PAPA ROD (BLM, 2000b) allowed project components on BLM-administered public lands in the PAPA (see Table 2.3-2) and stated that development beyond the specified limits would require additional supplemental environmental impact analysis. Wellfield components allowed by the PAPA ROD, and summarized in Table 2.3-2, had not reached the limits on development by November 2006.

Table 2.3-2
PAPA ROD Allowed Components Compared to Development since the PAPA ROD through November 2006[1]

PAPA ROD Allowed Component	Number	Development (July 2000 through November 2006)
Initial well pad locations on all lands and minerals with the PAPA	900 well pads	285 well pads
Producing wells and/or well pads on all lands and minerals with the PAPA	700 wells or well pads[2]	613 wells
Production facilities at individual well locations	700	Less than 613
Central off-site production facilities	None specified	None
Compressor facility sites	4	3
BP Amoco Field Office	1	1
Miles of sales pipeline corridor for multiple pipelines	121.5	14.5 (in the PAPA)
Miles of access road (including collector, local, and resource roads)	276.0	179.2
Miles of gas gathering pipeline system	280.0	115.9

[1] Totals do not include 55 well pads constructed and 29 producing wells drilled before July 2000.
[2] See Section 1.4 in Chapter 1 for discussion on ambiguity of PAPA ROD regarding wells and well pads.

2.3.1.2 Management Area Well Pad Limits

The BLM's Preferred Alternative (*Resource Protection Alternative on Federal Lands and Minerals*), developed in the PAPA DEIS (BLM, 1999a) and authorized by the PAPA ROD (BLM, 2000b), was implemented through restrictions on exploration and development in each of nine MAs. Section 4 of the PAPA ROD provided specific limits of development in each MA based on the number of producing well pads. The PAPA ROD specifies that additional environmental analysis would be required if a MA reaches its well pad density limit. Management objectives for each MA were developed in the PAPA DEIS and were approved in the PAPA ROD.

Well pad construction since issuance of the PAPA ROD (BLM, 2000b) has been most extensive in MA 5 - *Big Game Winter Range and Sage Grouse Strutting and Nesting Habitat* (Table 2.3-3), with an estimated 123 well pads constructed at the end of 2006.

The highest density of well pads is in MA 9 - *Non-Federal Lands* in Section 16, T. 32 N., R. 109 W., a state-owned section surrounded by federal lands in MA 5. Although these lands are surrounded by big game crucial winter range, they are not subject to seasonal restrictions as they would be on federal lands.

Table 2.3-3
Management Area Limitations and Current Status of Well Pads

Management Area Limitations for Resource Protection in the PAPA ROD	Estimated Current Status of Well Pad Limitation July 2000 through November 2006
MA 1 - Lander Trail	
0 total producing well pads	0 total producing well pads
MA 2 - Mesa Breaks	
0 total producing well pads	0 total producing well pads
MA 3 - Unleased Federal Minerals	
0 total producing well pads	0 total producing well pads
MA 4 - Sensitive Viewshed	
28 total producing well pads	6 total producing well pads
MA 5 - Big Game Winter Range and Sage Grouse Strutting and Nesting Habitat	
212 total producing well pads	123 total producing well pads
MA 6 – Sage Grouse Strutting and Nesting Habitat	
183 total producing well pads	44 total producing well pads
MA 7 – Ross Butte/Blue Rim	
68 total producing well pads	25 total producing well pads
MA 8 - Minimal Conflict Area	
168 total producing well pads	32 total producing well pads
MA 9 - Non federal Lands[1]	
200 total producing well pads	55 total producing well pads
[1] BLM does not have jurisdiction on non-federal lands.	

As of November, 2006, none of the limits for well pads in an individual MA had been reached. *Big Game Winter Range and Sage Grouse Strutting and Nesting Habitat* (MA 5) and *Ross Butte/Blue Rim* (MA 7) are the most developed with approximately half of the allowable well pads constructed.

2.3.1.3 Air Quality Analysis Threshold

Since the PAPA ROD (BLM, 2000b) was issued, natural gas development in the PAPA has occurred at a faster pace than was analyzed in the PAPA DEIS (BLM, 1999a). The PAPA ROD specified an analysis threshold for emissions of 376.59 tpy of NO_x from compression and 693.50 tpy of NO_x from all sources in the field. The PAPA ROD states that if these analysis thresholds are exceeded, additional analysis would be conducted. The air quality impact

assessment modeling for the PAPA DEIS assumed 900 initial wells drilled, with 700 producing wells and up to eight drilling rigs operating in the PAPA at any one time. Subsequent NEPA analysis (BLM, 2004a) disclosed that NO_x emissions from all sources in the PAPA exceed the 693.50 tpy analysis threshold specified in the PAPA ROD, mostly due to the increased number of drilling rigs.

2.3.2 Surface Disturbance by Wellfield Component

Total surface disturbance by wellfield component, through November 2006, was determined from digitized QuickBird Satellite Imagery (resolution of 0.6 meter, digitized at a scale of 1:2,000) and concurrent aerial photography. Well pads with a variety of features (wellheads, pits, tank batteries) were clearly visible on the imagery as were roads and pipelines. An accurate status of revegetation could not be determined from the imagery. Therefore, for this analysis, all portions of well pads, roads, and pipelines are assumed to be disturbed and not reclaimed. Map 2.3-1 shows the existing wellfield surface disturbance in the PAPA as of November 2006, including surface disturbance that occurred before issuance of the PAPA ROD (BLM, 2000b).

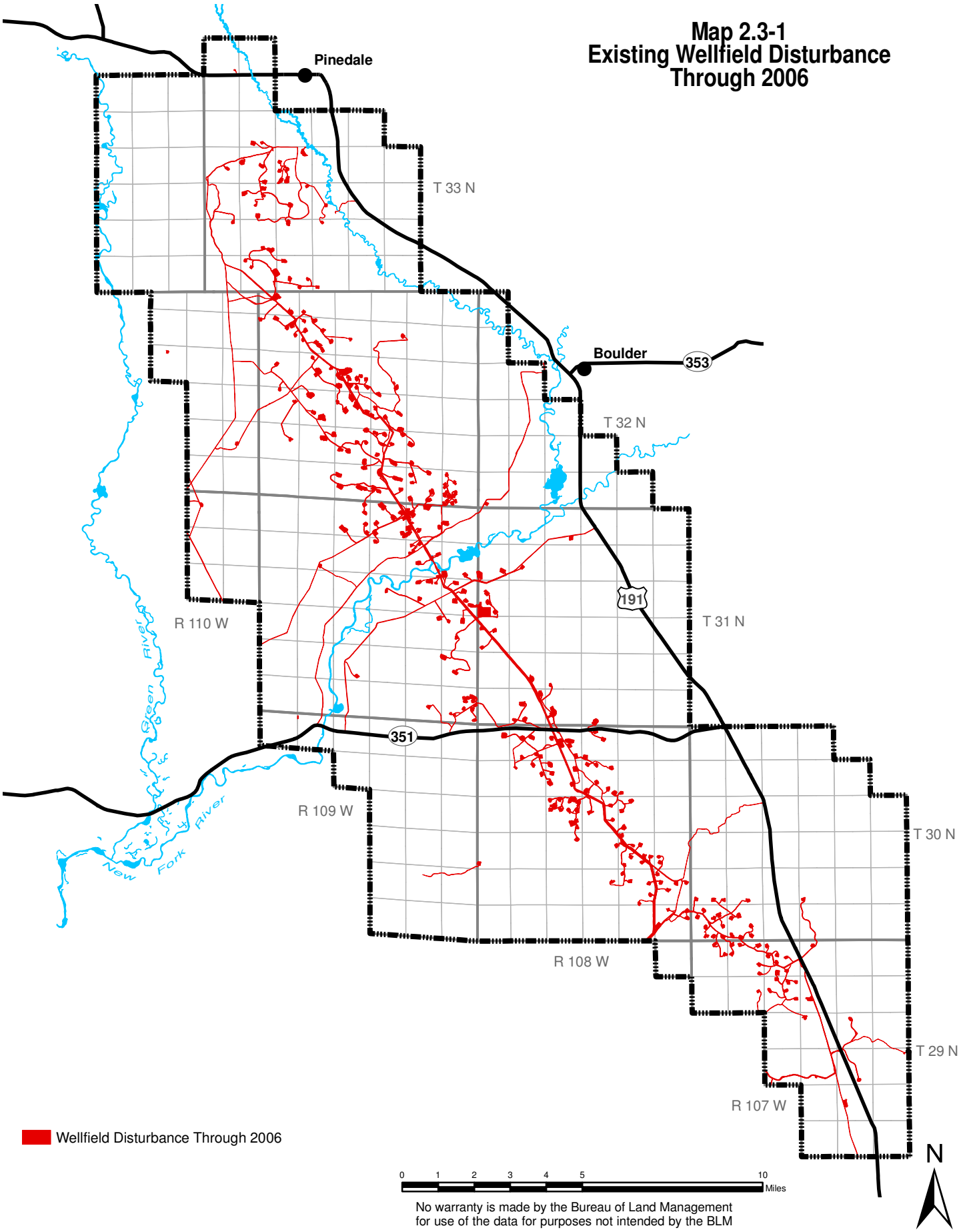
Table 2.3-4 provides the total estimated disturbance in the PAPA as a result of natural gas development through November 2006 (4,834.6 acres). Disturbance that occurred since issuance of the PAPA ROD in July 2000 is 4,393.3 acres. Although the PAPA ROD did not place limits on total surface disturbance from wellfield activity, it did place limits on surface disturbance associated with roads and gas gathering pipelines in terms of lineal dimensions (miles) rather than area disturbed (acres). Most surface disturbance is concentrated along the Anticline Crest (see Map 2.3-1).

Table 2.3-4
Total Estimated Surface Disturbance in the PAPA as a Result of Natural Gas Development through November 2006

	Pre-ROD		Post-ROD		Total	
Approved Component	**Number or miles**	**Total Area Disturbed (acres)**	**Number or miles**	**Total Area Disturbed (acres)**	**Number or miles**	**Total Area Disturbed (acres)**
Well Pads	55	320.4	285	2,018.8	340	2,339.2
Roads	6.4	60.7	179.2	932.0	185.5	992.7
Gas Gathering Pipelines	12.2	60.2	115.9	827.6	128.1	887.8
Gas Sales Pipelines	--	--	14.5	437.9	14.5	437.9
Compressor Stations	--	--	3	29.4	3	29.4
Stabilizer Facility	--	--	1	5.7	1	5.7
Anticline Disposal	--	--	1	76.6	1	76.6
Storage Yards	--	--	6	54.0	6	54.0
BP Amoco Field Office	--	--	1	11.3	1	11.3
Total		**441.3**		**4,393.3**		**4,834.6**

2.3.2.1 Well Pads

As of November 2006, there were 340 well pads in the PAPA, 55 of which were constructed before issuance of the PAPA ROD (BLM, 2000b). Since July 2000, 285 well pads have been constructed (Table 2.3-4) and are subject to the limit of 700 producing well pads in the PAPA ROD. Therefore, the limit for total well pads allowed in the PAPA ROD had not been reached by November 2006.


Map 2.3-1
Existing Wellfield Disturbance
Through 2006
Pinedale
Boulder
353
T 33 N
T 32 N
T 31 N
T 30 N
T 29 N
R 110 W
R 109 W
R 108 W
R 107 W
191
351
Green River
New Fork River
Wellfield Disturbance Through 2006
0 1 2 3 4 5 10
Miles
N
No warranty is made by the Bureau of Land Management
for use of the data for purposes not intended by the BLM

2.3.2.2 Roads and Gas Gathering Pipelines

Before issuance of the PAPA ROD (BLM, 2000b), there were 6.4 miles of roads associated with natural gas development in the PAPA. The PAPA ROD allowed additional construction and/or upgrade of access roads on federal lands, including collector, local, and resource roads totaling approximately 276 miles. The roads in the PAPA are classified as follows:

- Arterial roads with high traffic volumes that pass through the PAPA such as state highways or county roads (not subject to limitations in the PAPA ROD);
- Two-lane collector roads that provide primary access to large blocks of land and connect with or extend the public road system;
- One or two-lane local roads that connect to collector roads but normally serve a smaller area and convey less traffic than collector roads; and
- Single lane resource roads from local or collector roads to individual well pads.

Map 2.3-2 shows the existing road network in the PAPA. Approximately 185.5 miles of local and resource roads have been constructed and/or improved since the PAPA ROD (BLM, 2000b) was issued. These roads are subject to the 276-mile limit in the PAPA ROD. This includes the upgrading of roads on federal lands that were present before issuance of the PAPA ROD. The limit allowed for roads in the PAPA ROD had not been reached by November of 2006.

The PAPA ROD (BLM, 2000b) approved an additional 280 miles of gas gathering pipelines to carry natural gas from individual well pads to a central location where the gas would be compressed into a sales pipeline. The approval included construction and operation of 3- to 16-inch diameter gathering pipelines. Approximately 128.1 miles of gas gathering pipelines were constructed between July 2000 and November 2006, which is below the limit allowed by the PAPA ROD.

In 2005, Questar installed a condensate and produced water gathering system (liquids gathering system) within their leaseholds in the northern portion of the PAPA. Potential environmental impacts associated with construction of the liquids gathering system were evaluated by BLM (2004a). The PAPA EIS did not consider installation and operation of a liquids gathering system or transportation of produced liquids from the PAPA to sales and disposal facilities. Therefore, the liquids gathering system is not considered part of the gathering pipeline limit set forth in the PAPA ROD.

2.3.2.3 Gas Sales Pipelines

The PAPA DEIS (BLM, 1999a) analyzed a gas sales pipeline route, including two alternative alignments, with a 200-foot wide right-of-way to accommodate multiple gas sales pipelines. Depending on alternatives, the route ranged from 119.6 to 121.7 miles. The PAPA ROD (BLM, 2000b) allowed a 121.5-mile route. Currently, a portion of the constructed gas sales pipeline extends for 14.5 miles in the PAPA with an estimated disturbance of 437.9 acres.

2.3.2.4 Compressor Stations

The PAPA ROD (BLM, 2000b) allowed four compressor station sites in the PAPA. There are currently three compressor station sites in the PAPA. They include the Pinedale/Gobblers Knob Compressor Station operated by QGM (Section 2, T. 31 N., R. 109 W.); the Paradise Compressor Station (Section 2, T. 31 N., R. 109 W.); and the Falcon Compressor Station (Section 36, T. 30 N., R. 108 W), both operated by JGGC. Total compression for the three stations is 58,948 horsepower (hp) for the compressor engines, with an additional 7,690 hp associated with generators and vapor recovery units for a total of 66,638 hp (see Table 2.3-5).

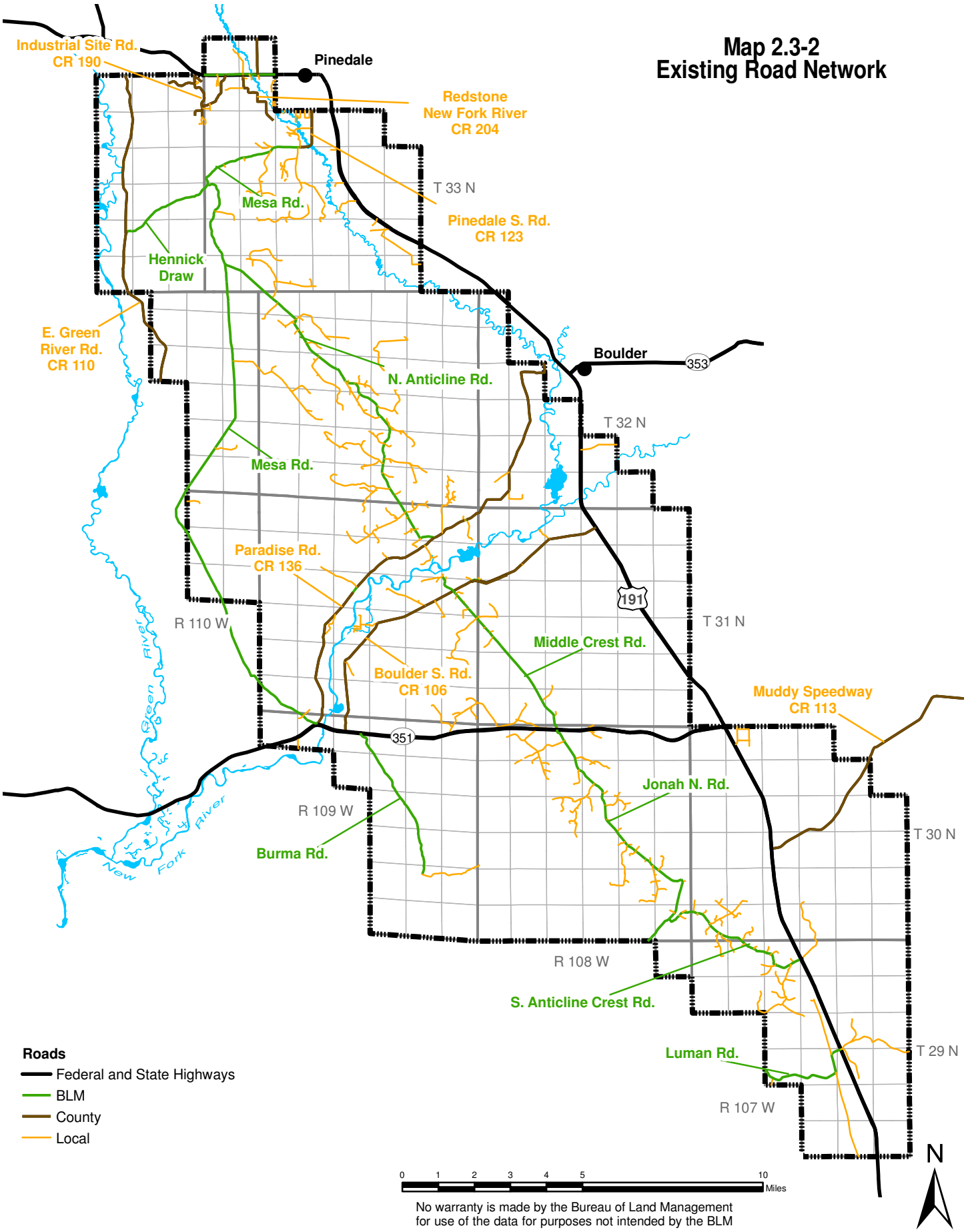

Map 2.3-2
Existing Road Network
Industrial Site Rd.
CR 190
Pinedale
Redstone
New Fork River
CR 204
T 33 N
Mesa Rd.
Pinedale S. Rd.
CR 123
Hennick
Draw
E. Green
River Rd.
CR 110
Boulder
353
N. Anticline Rd.
T 32 N
Mesa Rd.
Paradise Rd.
CR 136
191
R 110 W
T 31 N
Middle Crest Rd.
Boulder S. Rd.
CR 106
Muddy Speedway
CR 113
351
Green River
Jonah N. Rd.
R 109 W
T 30 N
Burma Rd.
New Fork River
R 108 W
S. Anticline Crest Rd.
Luman Rd.
T 29 N
R 107 W
Roads
Federal and State Highways
BLM
County
Local
0 1 2 3 4 5 10
Miles
N
No warranty is made by the Bureau of Land Management
for use of the data for purposes not intended by the BLM

Table 2.3-5
Horsepower and NO_x Emissions at Existing Compressor Stations in the PAPA through 2006

Compressor Station	Existing Compression (hp)	Existing Generation (hp)	Existing VRU (hp)	Total Compression (hp)	NO_x Emission (tpy)
Pinedale/Gobblers Knob	18,600	0	0	18,600	125.7
Paradise	18,340	3,600	245	22,185	161.2
Falcon	22,008	3,600	245	25,853	185.3
Total	**58,948**	**7,200**	**490**	**66,638**	**472.2**

As of November 2006, total disturbance associated with the three facilities covered 29.4 acres. The total NO_x emission for all compression in the PAPA as of November 2006 was estimated to be 472.2 tpy.

The PAPA ROD (BLM, 2000b) allowed for varying levels of compression, depending upon the compressor emissions rating, the level of construction and drilling activity, and the number of producing wells. The current level of 66,638 hp is within the amount of compression analyzed in the PAPA DEIS (26,000 to 96,000 hp with compressor emission ratings of 1.5 to 0.7 g/hp-hr, respectively); however, the total estimated NO_x emission of 472.2 tpy is over the 376.59 tpy NO_x analysis threshold specified in the PAPA ROD. This document provides the additional air quality impact analysis that is required by the PAPA ROD.

2.3.2.5 Stabilizer Facility

Disturbance associated with expansion of the Pinedale/Gobblers Knob Compressor Station for a stabilizer facility was analyzed under NEPA (BLM, 2004a) and included an additional 5.7 acres. The purpose of the condensate stabilizer is to make a “stable” product that can be metered and pumped to the crude petroleum pipeline for transport off the PAPA. A Documentation of Land Use Plan Conformance and Determination of NEPA Adequacy, or DNA, was issued by BLM in 2005. It allowed installation of an underground 25 kilovolt (kV) three-phase power distribution line to connect the condensate stabilizer to the Pinedale/Gobblers Knob Compressor Station.

2.3.2.6 Anticline Disposal Facility

The Anticline Disposal Facility, which disposes of produced water by evaporation and surface discharge (proposed to begin in 2007), is located in Section 18, T. 31 N., R. 108 W. and Section 13, T. 31 N., R. 109 W. The 76.6-acre site is located entirely on private land. BLM has issued rights-of-way for pipelines and roads to and from the facility.

2.3.2.7 Storage Yards

There are seven storage yards located in the PAPA that are located within various Operator leaseholds. The total surface disturbance for the storage yards is 54.0 acres.

2.3.2.8 BP Amoco Field Office

The PAPA ROD allowed construction of a BP Amoco Field Office. It was constructed in Section 26, T. 29 N., R. 107 W.

2.3.3 Drilling Rigs

Restriction on the number of drilling rigs present at any one time in the PAPA was not carried forward from the PAPA EIS to the PAPA ROD (BLM, 2000b). BLM concluded that limiting the number of drilling rigs (on federal and non-federal lands and minerals, combined) would be difficult to manage. Furthermore, BLM noted that seasonal restrictions to protect wildlife under

the Preferred Alternative (*Resource Protection Alternative on Federal Lands and Minerals*) would impose limits on the number of drilling rigs within specific MAs and would control the number of drilling rigs operating in the PAPA at any one time. Other factors including, but not limited to, the availability of drilling rigs and workers, market price of natural gas, and budgetary constraints, would limit drilling rigs.

The number of drilling rigs operating in the PAPA has increased since issuance of the PAPA ROD (BLM, 2000b). In each year, the fewest rigs have been present between November and April, which corresponds with BLM's seasonal restrictions for surface-disturbing activities in big game crucial winter ranges. There has been an increase in wells drilled and drilling rigs present each month during winter beginning in 2003-2004, due to the exceptions granted by BLM and the Decision Records for several limited winter drilling proposals (BLM, 2004a, 2005a, 2005b, 2005c, and 2006b).

Based on available data, drilling rigs averaged 62 days to drill wells to depths averaging 13,600 feet. There is considerable variation in the average amount of drilling time and bottom-hole depth, regardless of which geologic formation is targeted. Efficiency improves as more wells are drilled, and the Proponents have estimated that most wells could be drilled within 50 days. The deepest producing wells in the PAPA are under 14,600 feet total vertical depth and there are many (92 of them) in the range of 14,000 to 14,600 feet.

2.3.4 Other Allowed Components

Production Facilities. The PAPA ROD (BLM, 2000b) allowed up to 700 production facilities on individual well pad locations. Production facilities include tanks, separators, dehydration units, remote telemetry for computed assisted operations, and other equipment. Most of the well pads with producing wells have dedicated production facilities, although some production facilities are shared.

Central/off-site production facilities (C/OSPFs) were envisioned in the PAPA ROD (BLM, 2000b) for efficient operation of wells and/or to avoid or minimize disturbance to sensitive resources (wildlife, sensitive viewsheds, etc.) in areas with 80- and 40-acre well spacing. The PAPA ROD allowed C/OSPFs on a case-by-case basis. Directionally drilling one or more wells from a single pad was envisioned and could be authorized on a case-by-case basis. Currently, there are no C/OSPFs in the PAPA, although there has been extensive directional drilling since July 2000.

Water Wells. The PAPA ROD (BLM, 2000b) allowed for water supply wells drilled on natural gas well pads as water sources for drilling, completions, pipeline hydrostatic testing, and dust abatement. There were no limits placed on the number of water supply wells in the PAPA ROD because they are permitted through the Wyoming State Engineers Office (SEO) appropriation process. To date, approximately 100 Operator-drilled water wells are being monitored in the PAPA. Well depths range from 300 to 1,000 feet. Most of the Operator-drilled water wells are on the same pad as natural gas wells.

Central Delivery Points. In 2005, QGM constructed three Central Delivery Point (CDP) facilities within Questar's leaseholds, all of which were constructed on existing pads within existing disturbance. The purpose of the CDPs is to receive condensate, produced water, and natural gas from producing wells. The three CDPs were located on the Mesa 15-06, Stewart Point 16-18, and Mesa 14-16 well pads. Impacts associated with construction and operation of the CDPs on federal lands were analyzed under NEPA, and Categorical Exclusions (CXs) were issued. The CDP located on the Mesa 14-16 well pad is on state lands. Impacts associated with an underground 25 kV three-phase power distribution line to the Stewart Point 16-18 CDP was analyzed by BLM and the power distribution line was installed in 2005.

Water Handling Facility. QGM proposed to install a water storage facility near Highway 351. Impacts associated with the emergency tank storage facility were analyzed under NEPA by BLM, and an EA was issued; however, the facility was not constructed.

2.4 ALTERNATIVES

This section briefly discusses the Alternatives analyzed in detail in the PAPA DEIS (BLM, 1999a), introduces the Alternatives analyzed in detail in this Revised Draft SEIS, and presents Alternatives considered, but not analyzed in detail.

2.4.1 Alternatives Analyzed in the PAPA DEIS

The PAPA DEIS (BLM, 1999a) analyzed three action Alternatives; the *Standard Stipulation Alternative*, the *Resource Protection Alternative on Federal Lands and Minerals*, and the *Resource Protection Alternative on All Lands and Minerals*.

2.4.1.1 Standard Stipulation Alternative

This Alternative assumed that either 500 or 700 producing well pads would be developed entirely under BLM's Standard Mitigation Guidelines (Appendix A of the PAPA DEIS – BLM, 1999a), with lease stipulations on development issued at the time of leasing. Impact analysis was based on an average of up to eight drilling rigs operating in the PAPA year-round. Unless required by lease stipulations, the *Standard Stipulations Alternative* generally did not limit the density of development (the number of potential well pad locations per section) within any of the SRMZs. In most cases, the Alternative addressed anticipated impacts from locating up to 16 well pads per section in each of the SRMZs.

2.4.1.2 Resource Protection Alternative on Federal Lands and Minerals

This Alternative analyzed the impacts of implementing the *Resource Protection Alternative* on only federal lands and minerals. This Alternative assumed that either 500 or 700 well pads would be developed using BLM's Standard Mitigation Guidelines and lease stipulations. It disclosed the types of impacts that would remain even if BLM implemented additional controls to reduce impacts. It evaluated the impacts of slower paced development by limiting the number of drilling rigs operating at any one time in the PAPA to five. This Alternative considered pad drilling as an option for reducing surface disturbance and human presence in the PAPA. The term "pad drilling" refers to multiple wells with different bottom-hole locations directionally drilled from a single surface well pad. Use of centralized production facilities was advanced in this Alternative to eliminate storage of condensate and produced water on each well pad, collecting them at central locations. This Alternative, as modified in the PAPA ROD (BLM, 2000b), was implemented by BLM.

2.4.1.3 Resource Protection Alternative on All Lands and Minerals

This Alternative analyzed the impacts of implementing the *Resource Protection Alternative* throughout the PAPA (on all lands and minerals). This Alternative assumed that either 500 or 700 well pads would be developed using BLM's Standard Mitigation Guidelines and lease stipulations. The implementation of mitigation measures (pad drilling and centralized production facilities) on all lands in the PAPA was evaluated.

2.4.2 Alternatives Analyzed in Detail

In this Revised Draft SEIS, five Alternatives are analyzed in detail. In addition to the No Action Alternative and Alternatives B and C which were analyzed in the Draft SEIS (BLM, 2006a), there are two Alternatives (Alternative D and Alternative E) that are analyzed in response to comments received on the Draft SEIS. Supporting information for each Alternative is provided

in appendices which are detailed in Table 2.4-1. Some appendices are common to all Alternatives and others are unique to one Alternative or another.

Table 2.4-1
Summary of Appendices in Relation to each Alternative

Appendix		Alternative				
No.	**Title**	**A**	**B**	**C**	**D**	**E**
1	Authorizations in the PAPA ROD	X	--	--	--	--
2	Scoping Comments	X	X	X	X	X
3	Review of Impacts to Socioeconomics, Air Quality, and Wildlife Based Upon Various Levels of Drilling Rigs	--	X	X	X	--
4	BLM's Standard Practices and Restrictions for the Pinedale Anticline Project Area	X	X	X	X	X
5	Transportation Plans					
5A	Alternative A – Transportation Plan	X	--	--	--	--
5B	Alternative B – Transportation Plan	--	X		--	--
5C	Alternative C – Transportation Plan	--	--	X	--	--
5D	Alternative D – Transportation Plan	--	--	--	X	--
5E	Alternative E – Transportation Plan	--	--	--	--	X
6	Pipeline Design and Construction Procedures	X	X	X	X	X
7	Development Procedures for Wellfield Activities	X	X	X	X	X
8	Reclamation Plans					
8A	Alternative A – Reclamation Plan	X	--	--	--	--
8B	Alternative B – Reclamation Plan	--	X	--	--	--
8C	Alternative C – Reclamation Plan	--	--	X	--	--
8D	Alternatives D and E – Reclamation Plan	--	--		X	X
9	Wildlife and Habitat Mitigation Plans					
9A	Alternative B – Wildlife and Habitat Mitigation Plan	--	X		--	--
9B	Alternative C – Wildlife and Habitat Mitigation Plan	--	--	X	--	--
9C	Alternative D – Wildlife and Habitat Mitigation Plan	--	--	--	X	--
10	Wildlife Monitoring and Mitigation Matrix	--	--	--	X	--
11	Alternative D Mitigation	---	--	--	X	--
12	Hazardous Materials Summary	X	X	X	X	X
13	Individual Management Area Objectives and Restrictions/Limitations for Alternative E	--	--	--	--	X
14	Wyoming Protocol Agreement	X	X	X	X	X
15	Programmatic Agreement Shell/Ultra	X	X	X	X	X
16	Air Quality Impact Tables 2005	X	X	X	X	X
17	Wildlife Technical Report	X	X	X	X	X
18	Air Quality Impact Tables Project Alternative Modeling	X	X	X	X	X
19	Models of Potential Impacts to Groundwater	X	X	X	X	X

Differences in the Alternatives focus on areas where year-round development (construction, drilling, completion, and production) would be allowed with exceptions to seasonal restrictions for big game (pronghorn and mule deer) and greater sage-grouse seasonal habitats. Alternatives A and E include only limited year-round development through 2013-2014 as authorized in BLM's 2004 Decision Record (BLM, 2004a) in Questar's leaseholds. Alternatives B, C, and D include year-round development in certain areas within big game and greater sage-grouse seasonal habitats. All guidelines relating to protection of raptor nesting and wintering habitats would apply under all Alternatives. All Alternatives include provisions for Adaptive Management, varying levels of Proponent-committed mitigation as well as BLM required and suggested mitigation.

The PAPA ROD (BLM, 2000b) established seasonal restrictions in the form of guidelines for the protection of big game and greater sage-grouse in seasonal habitats. These restrictions as stated in Appendix A of the PAPA ROD are:

Big Game – to protect important big game winter habitat, activities or surface use will not be allowed from November 15 through April 30 within certain areas encompassed by the authorization. The same criteria apply to defined big game birthing areas from May 1 through June 30. The BLM can and does grant exceptions to seasonal restrictions if the wildlife biologist, in consultation with the WGFD, feels that granting an exception will not jeopardize the population being protected. Wildlife biologists use a set of criteria when considering a request for an exception.

Sage Grouse – Operators will comply with the following guidelines for avoidance of sage-grouse leks and nesting areas:

Surface disturbance within 0.25 mile of a sage grouse lek will be avoided. Linear disturbances such as pipelines, seismic activity, etc., could be granted exceptions since they do not have long-term, continuous activity associated with them that could impact breeding success.

- Permanent (life of the project), high profile structures such as buildings and storage tanks will not be constructed within 0.25 mile of a lek.
- During the sage grouse mating season, from March 1 through May 15, surface uses and activities will not be allowed between the hours of midnight and 9:00 a.m., within a 0.5-mile radius of active leks (i.e., leks occupied by mating birds).
- Operators will restrict construction activities from March 1 through July 31 within a 2.0-miles radius of active sage grouse leks in suitable sage grouse nesting habitat as determined during on-site reviews of proposed development areas. If an active nest is located, an appropriate buffer area will be established on a case-by-case basis to prevent direct loss of the nest or indirect impacts from human-related disturbance. The appropriate buffer distance will vary, depending on topography, type of activity proposed, and duration of disturbance.
- If active sage grouse strutting or nesting is identified in an area proposed for disturbance which is outside the dates of March 1 through July 31, surface-disturbing activities will be delayed in the area until strutting or nesting is completed.
- If existing information is not current, field evaluations for sage grouse leks and/or nests will be conducted by a qualified biologist prior to the start of activities in potential sage grouse habitat. These field evaluations for leks and/or nests will be conducted if project activities are planned in potential sage grouse habitat from February 1 through July 31. BLM wildlife biologists will ensure that such surveys are conducted using proper survey methods.

Subsequent to the PAPA ROD (BLM, 2000b), BLM issued guidance for the protection of greater sage-grouse habitat in Internal Memorandum (IM) WY2004-057 (BLM, 2004b), which set the current temporal and spatial restrictions for greater sage-grouse habitat. These restrictions are:

- Sage-grouse leks: 1) Avoid surface disturbance or occupancy within 0.25 mile of the perimeter of occupied sage-grouse leks. 2) Avoid human activity between 8 p.m. and 8 a.m. from March 1 - May 15 within 0.25 miles of the perimeter of occupied sage-grouse leks.
- Sage-grouse nesting/early brood-rearing habitat: Avoid surface disturbing and disruptive activities in suitable sage-grouse nesting and early brood-rearing habitat within two miles of an occupied lek, or in identified sage-grouse nesting and early brood-rearing habitat outside the 2-mile buffer from March 15 - July 15.

- Sage-grouse winter habitat: Avoid disturbance and disruptive activities in sage-grouse winter habitat from November 15 - March 14.

These restrictions are currently being utilized by the BLM. It is important to note the change in terminology. The PAPA ROD requires "During the sage grouse mating season, from March 1 through May 15, surface uses and activities will not be allowed between the hours of midnight and 9:00 a.m., within a 0.5-mile radius of active leks (i.e., leks occupied by mating birds) while the IM requires "Avoid surface disturbance or occupancy within 0.25 mile of the perimeter of occupied sage-grouse leks."

An active lek is defined as "Any lek that has been attended by male sage-grouse during the strutting season. Presence can be documented by observation of birds using the site or by signs of strutting activity." An occupied lek is defined as "A lek that has been active during at least one strutting season within the last 10 years." Management protection has been afforded to occupied leks.

The reason for the seasonal restriction on drilling and other surface disturbing activities is to inform the land user that if activities are to be conducted during the seasonally restricted period, it would be necessary to assess the impacts of the proposal on the resource being protected by the restriction. If the proposal would offer the same level of protection, or a higher level of protection than the seasonal restriction, it is reasonable for BLM to approve the proposal. One of the purposes of the analysis in this Revised Draft SEIS is to determine if one or more of the Alternatives would result in better protection for big game and greater sage-grouse populations than what is currently afforded by the seasonal restrictions set forth in the PAPA ROD.

Alternative A (the No Action Alternative) includes development through 2011 under current management practices in the PAPA, which would be managed as allowed in the PAPA ROD (BLM, 2000b). Alternatives B, C, and D are similar in that they all include year-round development through 2025 with 4,399 additional wells on 250 additional well pads. Alternatives B, C, and D are different in that they have different core areas, Alternatives C and D have additional development areas (DAs) and Alternative D includes a Potential Development Area (PDA). Alternative E includes an additional 4,399 wells but implementation would require a slower pace of development with construction of 415 additional well pads. Development under Alternative E would occur through 2033. Alternative E includes MAs similar to Alternative A but the MAs have been revised to reflect current lease status so that expired leases within other MAs have been re-assigned to MA 3 – Unleased Federal Minerals. The Alternative E Core Area is the same as the Alternative D Core Area. Under Alternative E, the Alternative D PDA is defined as the Buffer Area. The area outside of the PDA under Alternative D and the Buffer Area under Alternative E is defined as the Flanks.

Year-round development under Alternatives A and E would be limited to that allowed in BLM's 2004 Decision Record (BLM, 2004a) in Questar's leases in the northern portion of the PAPA through winter 2013-2014. Alternatives B, C, and D include year-round development by exception in otherwise seasonally restricted seasonal habitats for big game and greater sage-grouse. "Where" development would ultimately occur is dictated by the location of the resource. Core areas have been defined to delineate "how" and "when" year-round development would be allowed under Alternatives B, C, and D. A comparison of the elements of each of the five Alternatives is provided in Table 2.4-2.

Table 2.4-2
Comparison of Alternatives Analyzed in Detail

Alternative Elements	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Development Period	2011	2025	2025	2025	2033
Production Only Period	2051	2065	2065	2065	2073
Resource Recovery (TCF)	9	20 to 25	20 to 25	20 to 25	20 to 25
Number of Additional Wells	1,139	4,399	4,399	4,399	4,399
Number of New Well Pads	249	250	250	250	415
Proposed Total Wells Pads in PAPA	534	535	535	535	700
Number of Pads in PAPA[1]	589	590	590	590	755
Initial Disturbance (acres)	4,123.1	12,885.6	12,885.6	12,885.6	10,427.0
LOP Disturbance (acres)	1,622.5	4,012.5	4,012.5	4,012.5	4,185.6
New Roads (miles)	99.6	100	100	100	166
New Gas Gathering Pipelines (miles)	99.6	100	100	100	166
Liquids Gathering Pipelines (miles)	10.5	471	471	471	31.5
Development Management	By MA Objectives- in MAs 1 through 9	By CDAs in Core Area of 43,624 acres Three CDAs of up to 8 square miles each not to exceed 19 square miles total	By DAs in Core Area of 39,678 acres DA-1 12,644 acres DA-2 8,903 acres DA-3 7,127 acres DA-4 7,964 acres DA-5 3,040 acres	By DAs in Core Area of 45,415 acres – also by PDA of 24,875 acres DA-1 14,872 acres DA-2 9,222 acres DA-3 7,127 acres DA-4 7,964 acres DA-5 6,230 acres PDA-1 5,370 acres PDA-2 3,845 acres PDA-3 3,625 acres PDA-4 4,532 acres PDA-5 7,503 acres	By MAs Objectives and Limitations in MAs 1 through 9 in Core Area (45,415 acres), Buffer Area (24,875 acres), and Flanks
Year-Round Development	Allowed according to BLM's 2004 Decision Record in Questar's leaseholds through 2013-2014[2] Allowed by exception in other areas	Allowed within Core Area CDAs Allowed by exception in other areas	Allowed within DAs 1-4 Allowed by exception in other areas	Allowed within Core Area, possibly within PDA Allowed by exception in other areas	Allowed according to BLM's 2004 Decision Record in Questar's leaseholds through 2013-2014[2] Allowed by exception in other areas

Alternative Elements	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Delineation	Allowed anywhere within seasonal timing stipulations Allowed by exception in other areas	Allowed within the Core Area – estimated completion within 5 years Allowed by exception in other areas	Allowed anywhere within seasonal timing stipulations Allowed by exception in other areas	Allowed within the Core Area, possibly in PDA Allowed by exception in other areas except on federal suspended and term NSO leases for at least 5 years	Allowed anywhere within seasonal timing stipulations Allowed by exception in other areas
Concentrated Development (simultaneous construction, drilling, completion, production)	Limited – similar to current management practices	Yes	Yes	Yes	Limited – similar to current management practices
Drilling Rig Movement	Moves to accommodate seasonal restrictions	Rigs stay on pad until pad completed to extent practical	Rigs stay on pad until pad is completed and never come back	Rigs stay on pad until pad completed to extent practical	Moves to accommodate seasonal restrictions
Interim Pad Reclamation	Limited	Yes	Yes	Yes	Limited
Big Game (pronghorn and mule deer) Seasonal Timing Restrictions	Applies in restricted areas except for as allowed according to BLM's 2004 Decision Record in Questar's leaseholds through 2013-2014[2]	Apply in all seasonally restricted areas except for the CDAs	Applies in all seasonally restricted areas outside of the Alternative C Core Area	Applies in all seasonally restricted areas outside of the Alternative D Core Area and possibly the PDA	Applies in restricted areas except for as allowed according to BLM's 2004 Decision Record in Questar's leaseholds through 2013-2014[2]
Greater Sage-Grouse 0.25 mile NSO	Applies across entire PAPA	Applies across entire PAPA	Applies across entire PAPA	Applies across entire PAPA	Applies across entire PAPA
Greater Sage-Grouse Seasonal Timing Restrictions	Applies in restricted areas except for as allowed according to BLM's 2004 Decision Record in Questar's leaseholds through 2013-2014[2]	Apply in all seasonally restricted areas except for the CDAs and as allowed according to BLM's 2004 Decision Record in Questar's leaseholds through 2013-2014[2]	Applies in all seasonally restricted areas outside of the Alternative C Core Area	Applies in all seasonally restricted areas outside of the Alternative D Core Area and possibly the PDA	Applies in restricted areas except for as allowed according to BLM's 2004 Decision Record in Questar's leaseholds through 2013-2014[2]
Lander Trail 0.25 mile NSO	No Surface Occupancy within 0.25 mile of the Lander Trail	No Surface Occupancy within 0.25 mile of the Lander Trail	No Surface Occupancy within 0.25 mile of the Lander Trail	No Surface Occupancy within 0.25 mile of the Lander Trail	No Surface Occupancy within 0.25 mile of the Lander Trail
Adaptive Management	Yes	Yes	Yes	Yes	Yes

Alternative Elements	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
BLM's Standard Practices and Restrictions for the Pinedale Anticline Project Area	Apply Appendix 4	Apply Appendix 4	Apply Appendix 4	Apply Appendix 4	Apply Appendix 4
Transportation Plan	Yes Appendix 5A	Yes Appendix 5B	Yes Appendix 5C	Yes Appendix 5D	Yes Appendix 5E
Reclamation Plan	Appendix 8A	Appendix 8B	Appendix 8C	Appendix 8D	Appendix 8D
Wildlife and Habitat Mitigation Plan	No	Yes Appendix 9A	Yes Appendix 9B	Yes Appendix 9 C	No
Wildlife Monitoring and Mitigation Matrix	No	No	No	Yes Appendix 10	No
Liquids Gathering System	Continued according to BLM's 2004 Decision Record[2]	Continued according to BLM's 2004 Decision Record[2] New in Shell and Ultra's leases in central and southern portions of the PAPA	Continued according to BLM's 2004 Decision Record[2] New in Shell and Ultra's leases in central and southern portions of the PAPA	Continued according to BLM's 2004 Decision Record[2] New in Shell and Ultra's leases in central and southern portions of the PAPA	Continued according to BLM's 2004 Decision Record[2]
Computer-Assisted Operations	Limited	Yes	Yes	Yes	Limited
Federal Suspended and Term NSO Leases	No	No	No	Yes 49,903 acres	No
Compensatory Mitigation	No	3:1 if Offsite, if necessary	3:1 if Offsite, if necessary	Expected $36 Million Monitoring and Mitigation Fund	No
Emissions Reductions	None	Tier 2 equivalent reductions for NO_x on selected rigs and according to BLM's 2004 Decision Record[2]	Reduction to 2005 NO_x levels within 1 year and 80 percent additional within 5 years	Reduction to 2005 NO_x levels within 1 year and 80 percent additional within 42 months	None

[1] Includes 55 pads constructed prior to issuance of the PAPA ROD.
[2] Source: BLM, 2004a.

2.4.2.1 Components Common to All Alternatives

Project components that are common to all Alternatives are discussed below.

Performance-Based Management. Performance-based objectives have been adopted to provide BLM greater flexibility in protection of physical, environmental, and cultural resources. Successful application of performance- or outcome-based resource management objectives require implementation of Adaptive Management principles, specifically requiring implementation of monitoring and subsequent evaluation to determine whether or not the requirements and/or standards (or use of new techniques and/or practices) have been applied and whether the desired objective has been achieved in a timely and efficient manner.

Adaptive Management. All Alternatives analyzed in this Revised Draft SEIS include elements of Adaptive Management. Alternative A includes Adaptive Management as described in the PAPA ROD (BLM, 2000b), which includes the PAWG. Adaptive Management under Alternatives B, C, and D would be based on Annual Planning Meetings attended by the BLM and other federal, state, and local agencies (the Review Team). Presentations by the Operators would provide information on existing development and results of monitoring studies. Recommendations would be made to the Review Team for future delineation and development. The Operators Annual and 10-year plans for development and delineation would be reviewed. The need for monitoring and mitigation as well as reclamation to offset impacts would be determined.

The decision to adapt management in order to meet resource objectives would be made and implemented by the BLM AO, see Figure 2.4-1. Only Alternative D includes a Wildlife Monitoring and Mitigation Matrix (Appendix 10) that would trigger specific Adaptive Management responses based upon monitoring information. For all Alternatives, in addition to the Annual Planning Meeting, the PAWG would continue to be an advisory group to the BLM.

Planning Process. The objectives and operating standards would be presented, reviewed, and implemented in the following steps:

- **Pre-application Consultation.** The Operators would present preliminary plans to BLM each year for activities that would occur during the following field season. During the pre-application consultation, the Operators would be informed of BLM procedures and acceptable operating standards applicable to the proposed activities. The Operators would be required to have met all necessary federal, state, and local permit requirements prior to the beginning of field work. The BLM, the Operators, and other affected parties may visit the proposed site to identify issues and discuss alternatives during the pre-application consultation.
- **Evaluate Application.** BLM would review the proposal to:
    - Determine if the proposal complies with all applicable Outcomes and Operating Standards; this may be accomplished by adhering to the recommended requirements/standards or by the use of new techniques/practices that meet the objective(s).
    - Additional environmental analysis (e.g., EA or EIS), may be required by BLM prior to approving new mitigation that may be proposed, to address issues identified throughout the consultation and planning process.
    - Identify appropriate monitoring levels to determine the effectiveness of the mitigation, applicable operating standards, or proposed new operating techniques and methods.

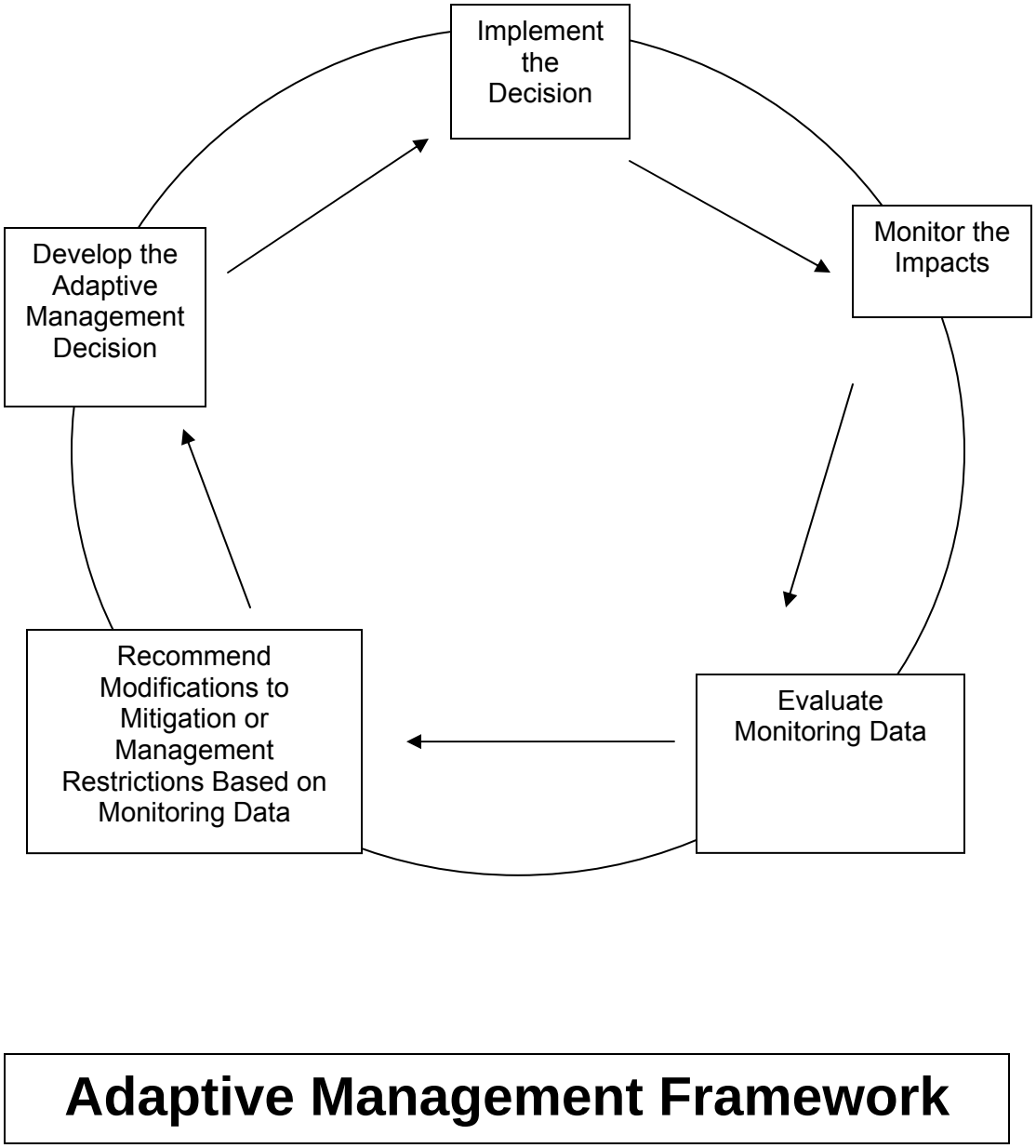


Figure 2.4-1
Adaptive Management Framework

- **Review Written Application for Completeness.** Operators and BLM would meet again to finalize plans for implementation. After initial review of the written application, the application may be rejected or accepted or additional information may be requested.
- **Issue Authorization**. BLM would issue authorizations with appropriate terms and conditions of approval identified or attached.

Mitigation Requirements. BLM would incorporate environmental Best Management Practices (BMPs) into the APD Surface Use Plan of Operations by the Operator under all Alternatives. BMPs are provided in *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development Fourth edition, 2006* – a joint effort by USDI-BLM and USDA-USFS (2006), also known as the Gold Book. Proponent committed mitigation varies by Alternative.

Environmental Protection Measures. BLM's Standard Practices and Restrictions for the Pinedale Anticline Project Area (Appendix 4) would apply to all Alternatives. The 0.25-mile buffer surrounding the Lander Trail would continue to be no surface occupancy (NSO). A NSO would also be maintained within the 0.25-mile buffer surrounding greater sage-grouse leks.

Transportation Requirements. The number of vehicles in and out of the PAPA on a daily basis varies seasonally. During the development period (while construction, drilling and completion are occurring), traffic would be greater in summer than in winter, due to traffic required for construction of roads, well pads, and pipelines which generally does not occur in the winter due to frozen soil conditions. Workers, material, and equipment would be transported to the PAPA over U.S. Highways 191 and 189, State Highway 351, and county and BLM roads located in the PAPA. During the production period, traffic under each Alternative is expected to be consistent through all seasons though decreasing over time as gas production declines. A comparison of traffic requirements for each of the Alternatives for 2009 (the year with the greatest development) is provided in Table 2.4-3 below. Transportation Plans for the various Alternatives are provided in Appendix 5.

Table 2.4-3
Comparison of Traffic (vehicles per day)
During Development for all Alternatives in 2009

	Alternatives A andE[1]			Alternatives B, C and D		
	Light	**Heavy**	**Total**	**Light**	**Heavy**	**Total**
Summer	1,917	1,061	2,978	622	600	1,222
Winter	1,547	692	2,239	521	448	969

[1] Shell/Ultra liquids gathering system is not included in Alternatives A and E.

Workforce Requirements. The estimated workforce requirements provided by the Proponents to develop a single well in the PAPA are provided in Table 2.4-4. The Proponents provided estimates for operating and maintaining a producing well in the PAPA (see Table 2.4-5).

Table 2.4-4
Workforce Requirements Necessary to
Develop a Single Well under all Alternatives

Category	Average Number of Workers	Average Number of Days
Well Pad and Access Road Construction	15	5
Rig Up/Down	15	5
Drilling	25	50
Testing and Completion	20	12

Table 2.4-5
Workforce Requirements Necessary to Operate and Maintain a Single Well[1,2]

Development Scenario	Average Number of Workers
With liquids gathering system	0.076
Without liquids gathering system	0.120

[1] Estimates include field and office employees and contractors.
[2] Assumes 4,800 producing wells (existing and projected).

Pipeline Corridors. The BLM proposes the designation of three pipeline corridors to support construction and operation of future pipelines for transport of natural gas-related production (natural gas, crude petroleum, and produced water) from the PAPA (see Map 2.4-1). The corridors would mostly parallel, and be located adjacent to, existing pipeline corridors connecting the PAPA with natural gas processing plants in southwest Wyoming. The BLM has determined the need for such corridors based on:

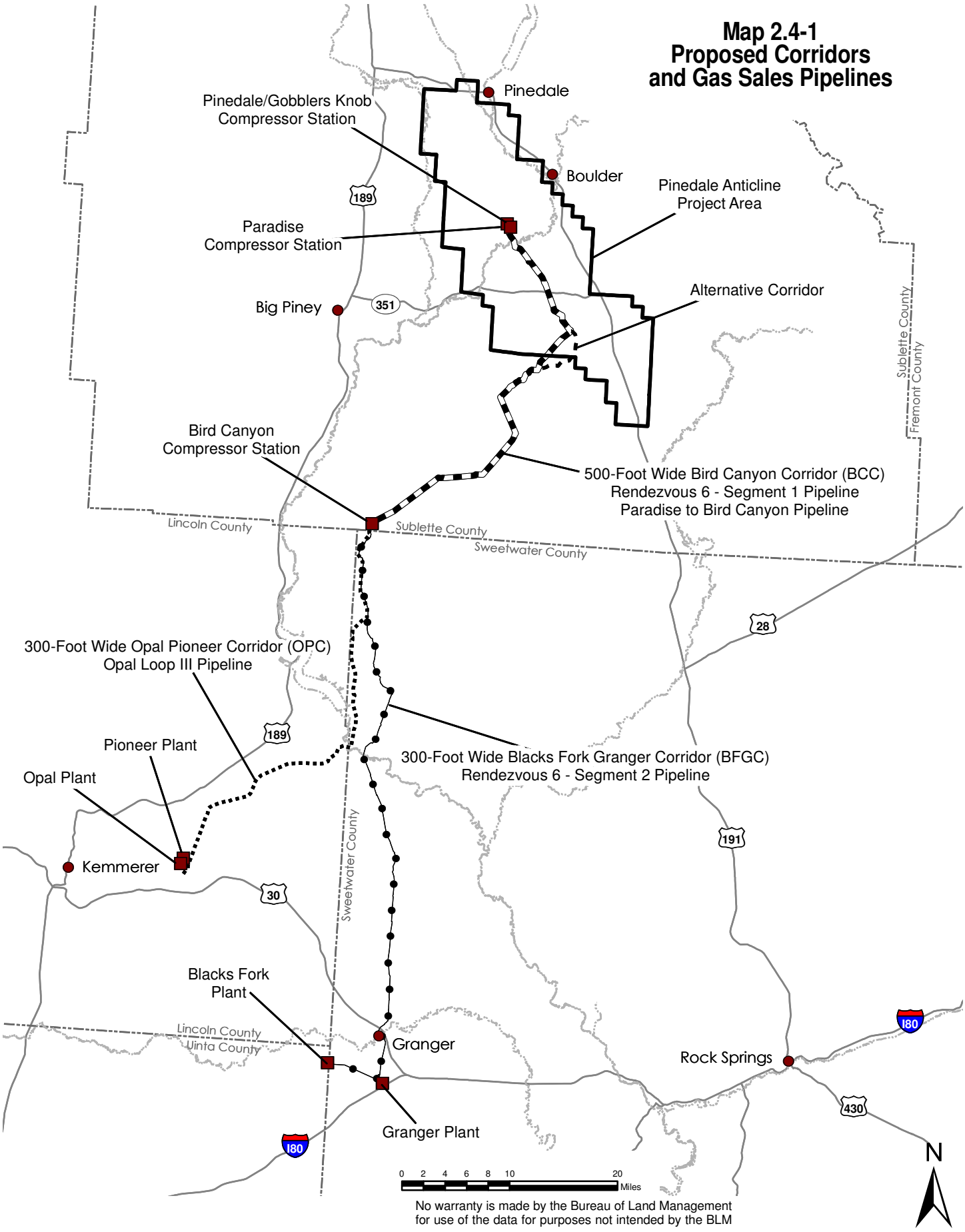
- Continued success in the development of natural gas resources in the PAPA;
- Indications, initial plans, and actual proposals by industry for the construction and operation of additional pipeline capacity to transport the increasing volumes of natural gas and other hydrocarbon products from the PAPA and Jonah Field Project Area to market;
- An agency determination that the existing pipeline corridors are full; and
- Provisions of the 2005 Energy Policy Act encouraging location of pipelines in common corridors and providing for expedited NEPA approvals.

The proposed pipeline corridors are discussed below:

1. The 500-foot wide, 41.5-mile long Bird Canyon Corridor (BCC) would mostly parallel and be adjacent to the existing 200-foot wide pipeline corridor between the PAPA (Pinedale/Gobblers Knob and Paradise compressor stations, Section 2, T. 31 N., R. 109 W.) and the Bird Canyon Compressor Station (Section 34, T. 27 N., R. 111 W.)
2. The 300-foot wide, 62.1-mile long Blacks Fork Granger Corridor (BFGC) would mostly parallel and be adjacent to the existing 200-foot wide pipeline corridor between the Bird Canyon Compressor Station and the Blacks Fork Gas Processing Plant (Section 10, T. 18 N., R. 112 W.) with an intermediate connection into the Granger Gas Processing Plant (Section 16, T. 18 N., R. 111 W.).
3. The 300-foot wide, 45.5-mile long Opal Pioneer Corridor (OPC) would mostly parallel and be adjacent to the existing 200-foot wide pipeline corridor between the Bird Canyon Compressor Station and the Opal Gas Processing Plant (Section 27, T. 21 N., R. 114 W.) with an intermediate connection into the Pioneer Gas Processing Plant (Section 22, T. 21 N., R. 114 W.).

Of the 41.5 miles of proposed BCC between the adjacent Pinedale/Gobblers Knob and Paradise compressor stations and the Bird Canyon Compressor Station, approximately 20.2 miles would be located away from the boundary of the existing pipeline corridor. Approximately 18.8 miles of the 20.2 miles would be located on BLM-administered public lands.

Approximately 1.8 miles (0.8 mile of federal lands) of the proposed 300-foot wide, 62.1-mile long BFGC between Bird Canyon Compressor Station and the Blacks Fork Gas Plant would be located away from the boundary of the existing pipeline corridor. The location of the proposed 300-foot wide, 45.5-mile long OPC between the Bird Canyon Compressor Station and the Opal Gas Processing Plant would be adjacent to an existing corridor for its entire length.


Map 2.4-1
Proposed Corridors
and Gas Sales Pipelines
Pinedale
Pinedale/Gobblers Knob
Compressor Station
Boulder
Pinedale Anticline
Project Area
189
Paradise
Compressor Station
Alternative Corridor
Big Piney
351
Sublette County
Fremont County
Bird Canyon
Compressor Station
500-Foot Wide Bird Canyon Corridor (BCC)
Rendezvous 6 - Segment 1 Pipeline
Paradise to Bird Canyon Pipeline
Lincoln County
Sublette County
Sweetwater County
28
300-Foot Wide Opal Pioneer Corridor (OPC)
Opal Loop III Pipeline
189
Pioneer Plant
Opal Plant
300-Foot Wide Blacks Fork Granger Corridor (BFGC)
Rendezvous 6 - Segment 2 Pipeline
191
Kemmerer
30
Sweetwater County
Blacks Fork
Plant
Lincoln County
Uinta County
Granger
Rock Springs
I80
430
Granger Plant
I80
0 2 4 6 8 10 20
Miles
N
No warranty is made by the Bureau of Land Management
for use of the data for purposes not intended by the BLM

Gas Sales Pipelines. RGS proposes to construct a 103.6-mile long, 30-inch diameter, natural gas pipeline (Rendezvous Phase 6 or R6 Pipeline) within the proposed BCC and BFGC to transport natural gas produced in the PAPA to gas processing plants. Segment 1 of the proposed R6 Pipeline (41.5 miles) would be located in the BCC, beginning at the Pinedale/Gobblers Knob Compressor Station and ending at the Bird Canyon Compressor Station (see description of the BCC above). Segment 2 of the proposed R6 Pipeline (62.1 miles) would begin at the Bird Canyon Compressor Station and end at the Blacks Fork Processing Plant (see description of the BFGC above). It is anticipated that the R6 Pipeline would be constructed during the summer and fall of 2008.

JGGC proposes to construct a 41.5-mile long, 36-inch natural gas pipeline (Paradise to Bird Canyon or PBC Pipeline) and a connecting 45.5-mile long, 30-inch pipeline (Opal Loop III Pipeline) to transport natural gas from the PAPA to gas processing plants (see Map 2.4-1). The PBC Pipeline would be located in the BCC and would parallel Segment 1 of the R6 Pipeline. The Opal Loop III Pipeline would be located in the OPC and would parallel the Bridger Pipeline that was constructed in 2006. It is anticipated that the PBC and Opal Loop III pipelines would be constructed after 2008.

The proposed R6 Pipeline (segments 1 and 2) and the PBC and Opal Loop III pipeline projects would include construction of ancillary facilities (valves, pigging equipment, side taps, and metering equipment). Table 2.4-6 shows the initial disturbance and the LOP disturbance for the pipelines. Each pipeline project would require a permanent right-of-way of 50 feet for operation and maintenance. The entire construction right-of-way and permanent right-of-way would be revegetated. It is assumed that approximately 1.0 acre would be required for each pipeline for permanent ancillary aboveground facilities. Construction procedures for the proposed pipelines are included in Appendix 6.

Table 2.4-6
Estimated Initial and Life-of-Project Disturbance
for Gas Sales Pipelines and Granger Gas Processing Plant

Component	Number or Miles	Total Disturbance (acres)	Life-of-Project Disturbance (acres)
30-inch R6 Pipeline[1]	103.6 miles	1,506.9	1.0
R6 temporary extra work areas[2]	168 sites	23.3	0.0
R6 temporary extra work areas – HDDs[3]	4 sites	8.3	0.0
Subtotal		**1,538.5**	**1.0**
36-inch PBC Pipeline[1]	41.5 miles	603.6	1.0
PBC temporary extra work areas[2]		9.4	0.0
PBC temporary extra work areas – HDDs[3]	2 sites	4.2	0.0
Subtotal		**617.2**	**1.0**
30-inch Opal Loop III Pipeline[1]	45.5 miles	661.8	10
Opal Loop III temporary extra work areas[2]		10.5	0.0
Subtotal		**672.3**	**1.0**
Granger Gas Processing Plant[4]	1 site	86.4	86.4
Total Sales Pipelines/Gas Plant	**1 site**	**2,914.4**	**89.40**

[1] Disturbance based on 120 foot construction right of way width.
[2] Temporary extra work areas are required for road, foreign line, historic trail, and waterbody crossings.
[3] Horizontal directional drills.
[4] Granger Gas Plant analyzed for air quality impacts only.

Gas Processing Plant Expansion. In conjunction with the proposed R6 Pipeline Project, RGS proposes to expand the existing 33.6-acre Granger Gas Processing Plant by 86.4 acres, for a total of 120 acres on BLM-administered public lands in Section 16, T. 18 N., R. 111 W. The purpose of the proposed expansion is to construct and operate additional natural gas processing facilities to sufficiently increase processing capacity for an anticipated increased input of 600 million standard cubic feet per day (MMSCF/D) of natural gas and crude petroleum. The current Granger Gas Processing Plant capacity is 600 MMSCF/D. The expansion would represent a 100 percent increase in treatment capacity. RGS and Mountain Gas Resources (MGR) anticipate constructing and operating new facilities, including compressors, gas processing equipment, liquids handling equipment, and supporting facilities, such as office space, parking, and fencing.

Specific facility requirements, engineering, and designs are currently under development; however, maximum emissions have been estimated, and these values have been included in the air quality impact analysis for this Revised Draft SEIS. RGS and MGR have assumed a maximum emissions scenario based on emissions from the current Granger Gas Processing Plant with a 600 MMSCF/D treatment configuration. Potential impacts to air quality associated with construction and operation of the Granger Gas Processing Plant have been analyzed in this document. Construction of the Granger Gas Processing Plant would require further NEPA analysis for impacts to other resources.

Trunk Pipelines. QGM is proposing to install two 15.3-mile long, 30- to 42-inch gas pipelines from the Stewart Point Area to the Pinedale Gobblers Knob Compressor Station along existing rights-of-way. Initial disturbance requires 370.9 acres (200-foot construction right-of-way) adjacent to, or within, existing rights-of-way for most of the route. QGM is also proposing to install an 18-mile long, 8-inch water line from the Stewart Point area to Highway 351. This requires an initial disturbance of 109.1 acres (50-foot construction right-of-way) adjacent to, or within, existing rights-of-way for most of the route.

Ancillary Facilities. Expansion of existing and construction of new ancillary facilities, including compressor stations, central gathering facilities (CGFs), stabilizer sites, and water truck unloading facilities, that are components common to all Alternatives are described below. Construction of additional ancillary facilities that are not common to all Alternatives are described within each Alternative in which they are included.

Compressor Stations. QGM and JGGC propose expansion of three compressor stations in the PAPA and one compressor station outside of the PAPA (Bird Canyon Compressor Station) before 2011 (see Table 2.4-7). The expansions include an additional 267,038 hp of compression, with additional LOP disturbance of 90 acres within the PAPA.

Central Gathering Facilities QGM is proposing six additional CGFs (formerly known as central delivery points) to support their existing liquids gathering system. Each CGF would require an additional 2 acres of disturbance for a LOP disturbance of 12 acres.

Stabilizer Facilities. QGM is proposing to expand the stabilizer site near the Pinedale/Gobblers Knob Compressor Station in support of their existing liquids gathering system. This expansion would require an additional LOP disturbance of 5 acres.

Water Truck Unloading Facilities. QGM is proposing to install truck unloading facilities near Highway 351 in the PAPA in support of their existing liquids gathering system. QGM's water trucking facility would require a LOP disturbance of 7 acres. QGM is proposing an additional truck unloading facility at the Falcon Compressor Station that would require an additional LOP disturbance of 15 acres.

Table 2.4-7
Compressor Station Expansion Common to all Alternatives

Compressor Station Name	Field	Owner	Location	Additional Compression (hp)	Additional Disturbance (acres)
Pinedale/Gobblers Knob	PAPA	QGM	Section 2, T. 31 N., R. 109 W.	31,000 (2009)	20
Paradise	PAPA	JGCC	Section 2, T. 31 N., R. 109 W.	59,000 (2011) 125,000 (2015)	40
Falcon	PAPA	JGCC	Section 36, T. 30 N., R. 108 W.	7,366 (2011) 30,000 (2015)	30
Bird Canyon	SE of Jonah	JGCC	Section 34 T. 27 N., R. 111 W.	14,672 (2011)	0
Total				**267,038**	**90**

2.4.2.2 Alternative A (No Action Alternative)

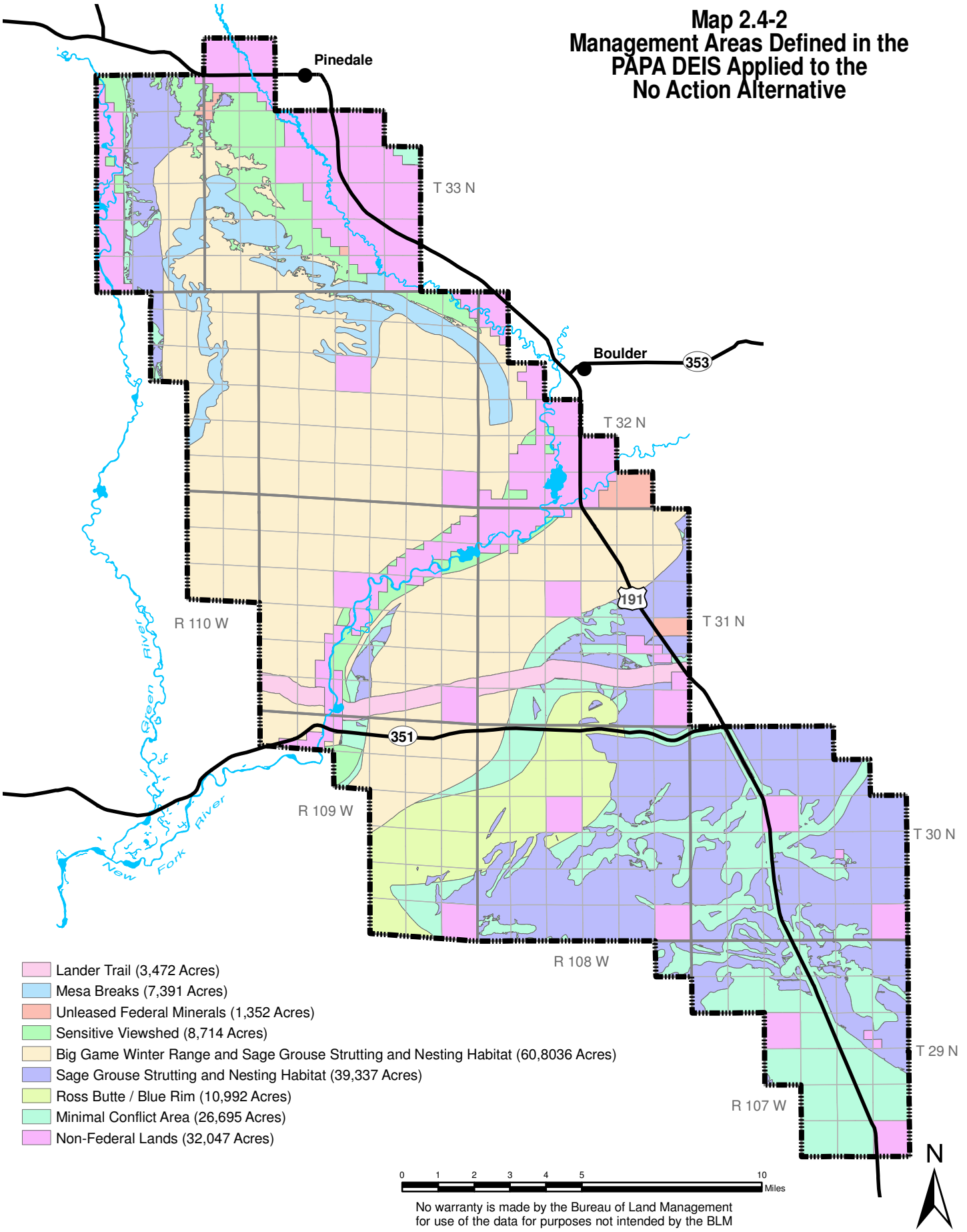
In many instances, the No Action Alternative means "no project" when a new project is proposed. The No Action Alternative can also mean "no change", in this case, from BLM's current management in the PAPA. In this Revised Draft SEIS, the No Action Alternative has elements of both meanings; the Operators' Proposed Action would not occur and BLM would continue to manage natural gas development in the PAPA, based on all provisions of the PAPA ROD (BLM, 2000b) and subsequent Decision Records (BLM, 2004a, 2005a, 2005b, 2005c, and 2006b). Both meanings are consistent with the USDI's (2004) NEPA Revised Implementing Procedures. Mitigation under the No Action Alternative would be the measures set forth in the PAPA ROD.

Continued Management Practices. The No Action Alternative is based on elements allowed by the PAPA ROD (BLM, 2000b) and subsequent BLM Decision Records (BLM, 2004a, 2005a, 2005b, 2005c, and 2006b) including:

- Allowed Project Components (PAPA ROD Section 2);
- Administrative Requirements and Conditions of Approval (PAPA ROD Section 3);
- Management Area Exploration and Development Restrictions and Limitations for Resource Protection (PAPA ROD Section 4); and
- Allowed project components in subsequent Decision Records (Appendix 1).

Development in the PAPA beyond the limits and analysis thresholds specified in the PAPA ROD would require additional environmental review. The limits and analysis thresholds are still in place in the No Action Alternative. The PAPA ROD did not specify the type or extent of the additional environmental review that would be required.

The PAPA ROD (BLM, 2000b) established limits on the number of producing well pads specified for each of nine MAs (see Map 2.4-2). There are timing and geographic restrictions on surface development in some MAs that would be carried through the No Action Alternative. For example, in MA 5 - *Big Game Winter Range and Sage Grouse Strutting and Nesting Habitat*, the PAPA ROD stipulated that drilling was not allowed on federal lands and minerals between November 15 and April 30, although BLM may grant exceptions to the restriction in consultation with WGFD (Section 1.3). Similarly, in MA 5 and MA 6 - *Sage Grouse Strutting and Nesting Habitat*, additional seasonal restrictions were stipulated to protect greater sage-grouse


Map 2.4-2
Management Areas Defined in the
PAPA DEIS Applied to the
No Action Alternative
Pinedale
Boulder
353
191
351
T 33 N
T 32 N
T 31 N
T 30 N
T 29 N
R 110 W
R 109 W
R 108 W
R 107 W
Green River
New Fork River
Lander Trail (3,472 Acres)
Mesa Breaks (7,391 Acres)
Unleased Federal Minerals (1,352 Acres)
Sensitive Viewshed (8,714 Acres)
Big Game Winter Range and Sage Grouse Strutting and Nesting Habitat (60,8036 Acres)
Sage Grouse Strutting and Nesting Habitat (39,337 Acres)
Ross Butte / Blue Rim (10,992 Acres)
Minimal Conflict Area (26,695 Acres)
Non-Federal Lands (32,047 Acres)
0 1 2 3 4 5 10 Miles
No warranty is made by the Bureau of Land Management
for use of the data for purposes not intended by the BLM
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seasonal habitats, applicable on a site-specific basis, but which could limit drilling activities between March 1 and July 31.

The Proponents provided information on how they would further develop the PAPA under the No Action Alternative (current management practices) while adhering to seasonal restrictions for wildlife. Using their projections, limitations to wellfield development as set forth in the PAPA ROD (BLM, 2000b), would be reached as follows:

- 212 well pad limit in MA 5 would be reached in 2009,
- Approximately 276.0 miles of road would be reached in 2011,
- 68 well pad limit in MA 7 would be reached in 2011,
- 28 well pad limit in MA 4 would be reached in 2013, and
- 700 well pad limit in the entire PAPA would be reached in 2014.

The air quality impact analysis conducted for the PAPA DEIS (BLM, 1999a) included 700 producing well locations, 900 wells drilled, and up to eight drilling rigs operating in the PAPA. It further assumed approximately 1,000 hp per drilling rig. The PAPA ROD (BLM, 2000b, page 16) states:

"If activity and corresponding emission assumptions and/or impacts exceed those identified in the Pinedale Anticline EIS (376.59 tons/year of NO_x emission from compressors or 693.5 tons/year NO_x emissions from the combination of construction/drilling, well production, and compression), the BLM, in cooperation and consultation with Wyoming Department of Environmental Quality-Air Quality Division (WDEQ-AQD), EPA Region VIII, USDA-Forest Service, and other affected agencies, will undertake additional cumulative air quality environmental review as required by CEQ regulations 40 CFR §1502.9(c)(1)(ii)."

Since the PAPA ROD (BLM, 2000b) was issued, natural gas development in the PAPA has occurred at a pace greater than was analyzed in the PAPA EIS. Assumptions of drill rig emissions and NO_x emissions from the combination of construction, drilling, completion, production and compression have been exceeded. The air quality impact analysis conducted for this Revised Draft SEIS serves as the additional environmental review referenced above and analyzes the current proposal.

In the No Action Alternative, air quality impacts were modeled for the Year-2007 to show the increase in impacts beyond that predicted in the PAPA DEIS (BLM, 1999a). The 2007 air quality impact analysis discloses impacts for current allowable development in the PAPA under the No Action Alternative. The 2007 air quality impact analysis assumed approximately 900 producing wells, 43 drilling rigs operating in the summer, and 30 drilling rigs operating in the winter, with approximately 3,875 hp for each drilling rig.

Even though the limit of 212 producing well pads in MA 5 allowed in the PAPA ROD would be attained in 2009, development would continue on pads in other MAs and on expanded pads in MA 5. It is reasonable to expect that additional analysis would be conducted after 2009. In 2011, the producing well pad limit of 68 would be reached in MA 7. The No Action Alternative, through 2011, includes an additional 1,139 producing wells.

Project Components. The project components in the No Action Alternative include well pads, roads, and gathering (gas and liquids) pipelines. Transportation corridors, gas sales pipelines, trunk pipelines, and some ancillary facilities are also included in the No Action Alternative. These components are required for continued transport of natural gas and liquids from the PAPA as development carries forward under the PAPA ROD (BLM, 2000b), and are detailed in Section 2.4.2.1 – Components Common to All Alternatives. Projected disturbance was determined from responses provided by the Proponents regarding how they would continue to

develop natural gas resources under the PAPA ROD and subsequent Decision Records (BLM, 2004a, 2005a, 2005b, 2005c, and 2006b).

The proposed project components and estimated disturbance for the No Action Alternative through 2011 (assuming continued well pad construction in all MAs in which limits in the PAPA ROD have not been reached) are provided in Table 2.4-8. Initial disturbance is defined as the amount of acreage that is disturbed at the time of construction. Initial disturbance for the No Action Alternative for well pads, roads, and gathering pipelines is 4,123.1 acres. LOP disturbance for the same components is expected to be 1,622.0 acres. LOP disturbance is defined as the amount of disturbance remaining once reclamation has occurred. For example, it is assumed that 60 percent of the initial disturbance would be reclaimed when all development activities have been completed. Likewise, it is assumed that 20 percent of the initial disturbance for roads would be reclaimed while 80 percent of the disturbance would remain to support continued operations.

Nearly all initial disturbance for pipelines would be reclaimed, leaving almost no LOP disturbance. In contrast, for other ancillary facilities such as compressor station expansion, central gathering facilities, etc., the LOP disturbance would be the same as the initial disturbance, i.e., none of the disturbance would be reclaimed until the facility is no longer in use.

Table 2.4-8
Estimated Initial and Life-of-Project
Disturbance under the No Action Alternative through 2011

Component	Number or Miles	Initial Disturbance (acres)	Life-of-Project Disturbance (acres)
Well Pads, Roads and Gathering Pipelines			
Well Pads[1]	249 new pads	2,560.0	1,024.0
Local and Resource Roads[2]	99.6 miles	603.7	483.0
Gas Gathering Pipelines[3]	99.6 miles	301.8	0.0
Liquids gathering pipelines – QGM[4]	10.5 miles	63.6	0.0
Subtotal		**3,529.1**	**1,507.0**
Trunk Pipelines and Ancillary Facilities			
30- to 42-inch Mesa Loop Lines[5]	15.3 miles	370.9	1.0
8-inch water line[6]	18.0 miles	109.1	0.5
Compressor Sites (expansion)	3 sites	90.0	90.0
Central Gathering Facilities	6 sites	12.0	12.0
Water Trucking Facility	1 site	7.0	7.0
Expand Stabilizer Site	1 site	5.0	5.0
Subtotal		**594.0**	**115.5**
Total Wellfield Components		**4,123.1**	**1,622.5**

[1] Disturbance includes new well pads and expansion of existing well pads. LOP disturbance assumes 60 percent reclamation of well pads.
[2] Assumes no new collector roads would be built within the PAPA, assumes 0.4 mile of road per new well pad with a construction right-of-way of 50 feet. LOP disturbance assumes 20 percent reclamation of roads.
[3] Assumes 0.4 mile of gas gathering pipeline per new well pad with a construction right-of-way of 25 feet.
[4] Estimate is based on number of new well pads for Questar only. Assumes 50-foot construction right-of-way.
[5] Disturbance is based on 200-foot construction right-of-way width. Includes two co-located 30- to 42-inch gas pipelines from Stewart Point to Pinedale/Gobblers Knob Compressor Station. Includes 30.6 miles of pipeline but because they are co-located, 200-foot construction right-of-way is 15.3 miles. The two pipelines will be built at separate times.
[6] Disturbance is based on 50-foot construction right-of-way width from Stewart Point area to Highway 351.

Wells and Drilling Rigs. The estimated number of wells, new well pads, and drilling rigs under the No Action Alternative by year is provided in Table 2.4-9. More drilling rigs would be operating in the summer than in the winter under the No Action Alternative because seasonal restrictions would apply in big game (pronghorn and mule deer) and greater sage-grouse seasonal habitats.

Table 2.4-9
Estimated Wells, New Well Pads, and Drilling Rigs by Year under the No Action Alternative

Year	Wells	Well Pads	Drilling Rigs	
			Summer	Winter
2007	231	92	43	30
2008	235	53	43	30
2009	236	54	43	30
2010	217	27[1]	40	27
2011	220	23[1]	40	27
Total	**1,139**	**249**		

[1] Well pads in MA 5 have been reduced from Proponent's projections because the PAPA ROD well pad limit of 212 pads in MA 5 would be reached in 2009.

Well Pads. The Proponents have proposed additional well pads within each MA. The additional well pads have been added to the current number of well pads in the PAPA (Table 2.4-10). From the progression in Table 2.4-10, it is evident that the threshold of 212 pads in MA 5 would be reached in 2009. Likewise, the threshold of 68 pads in MA 7 would be reached in 2011, assuming all well pads support producing wells.

Table 2.4-10
Total Number of Well Pads Within each Management Area that have been Proposed by the Proponents under the No Action Alternative

Year	Total Well Pads in Year – No Action Alternative											
	MA 4 Limit 28		MA 5 Limit 212		MA 6 Limit 183		MA 7 Limit 68		MA 8 Limit 168		MA 9 Limit 200	
	No.	Total	No.	Total	No.	Total	No.	Total	No.	Total	No.	Total
Existing 2006	--	6	--	123	--	44	--	25	--	32	--	55
2007	4	10	44	167	10	54	16	41	13	45	5	60
2008	4	14	22	189	9	63	6	47	8	53	4	64
2009	4	18	23	212	9	72	6	53	8	61	4	68
2010	4	22	0	212	8	80	6	63	7	68	2	70
2011	3	25	0	212	8	88	5	68	7	75	0	70

Under the No Action Alternative, when the limit for producing well pads is reached in a specific MA, additional development would be halted in the MA until additional environmental analyses are complete or until a well on a pad is no longer producing gas, is plugged, and the pad area is reclaimed for one full growing season. The reclaimed pad would be credited back to the MA and a new well pad could be developed, as long as the limit is not exceeded.

Initial disturbance estimates for 249 new well pads by 2011 is 2,560.0 acres, with a LOP estimated disturbance of 1,024.0 acres (Table 2.4-8). Reclamation of well pads would be similar to current reclamation practices.

Roads and Gathering Pipelines. Under the No Action Alternative, it is assumed that there would be no additional construction of collector roads in the PAPA. There would be an estimated 99.6 miles of local and resource roads constructed in the PAPA by 2011, for an initial disturbance of 603.7 acres and a LOP disturbance of 483.0 acres, assuming that 20 percent of the initial road disturbance is reclaimed after construction (see Table 2.4-8). It is estimated that there would be 99.6 miles of gas gathering pipelines and 10.5 miles of liquids gathering

pipelines (continuation of existing liquids gathering system in leaseholds currently held by Questar), for an initial disturbance of 301.8 and 63.6 acres, respectively. There is no LOP disturbance associated with construction of gathering pipelines because the entire disturbance is reclaimed after construction.

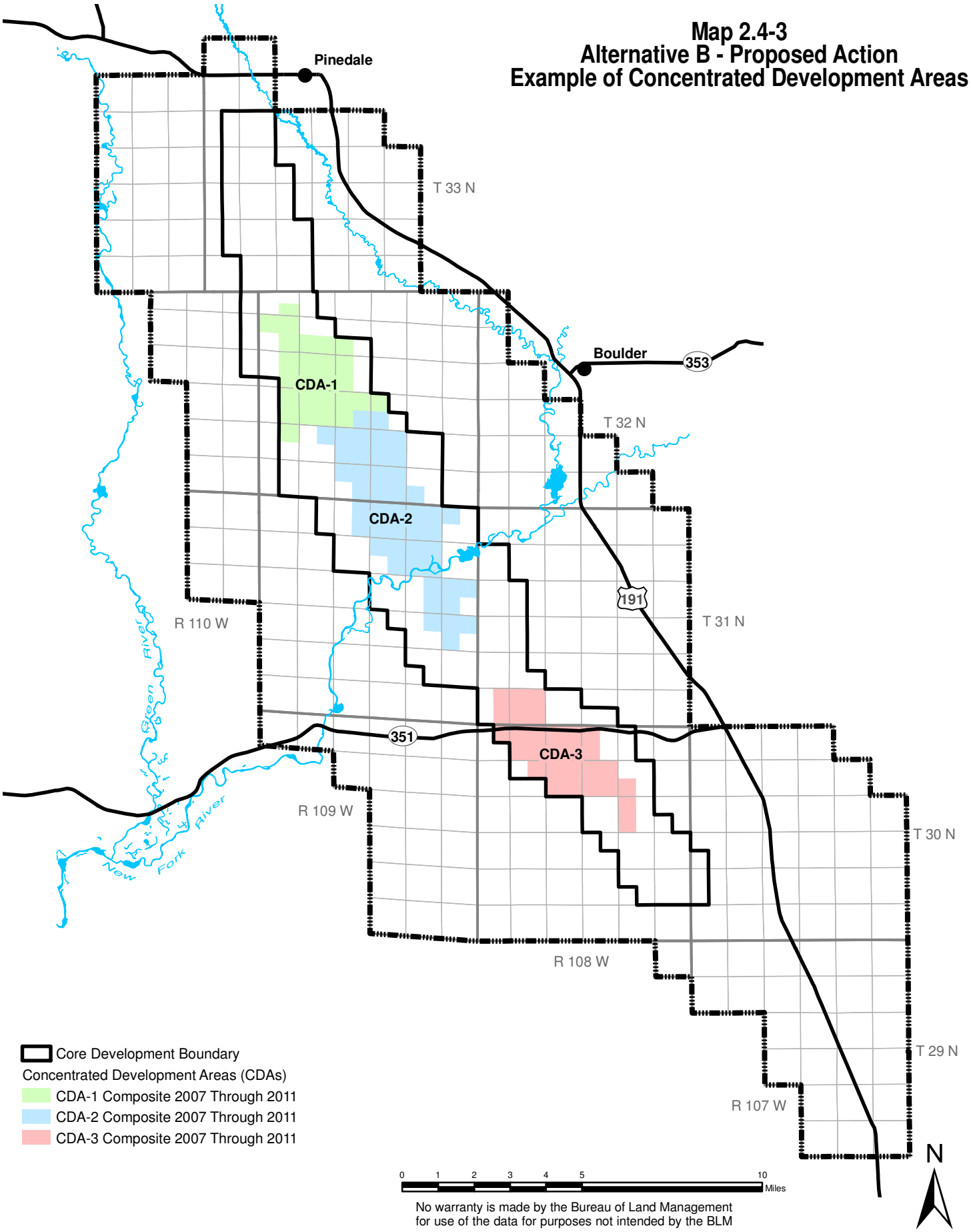
Year-Round Development. Under the No Action Alternative, year-round development would not be allowed in big game (pronghorn and mule deer) and greater sage-grouse seasonal habitats except as allowed by BLM's 2004 Decision Record (BLM, 2004a). This allowed limited year-round development within Questar's leaseholds through winter 2013-2014. Approved components in the Decision Record are provided in Appendix 1.

2.4.2.3 Alternative B

The Proponents have proposed a long-term development plan for the PAPA and are requesting exception to seasonal restrictions for big game (pronghorn and mule deer) and greater sage-grouse in seasonal habitats during the seasonally restricted periods. The long-term plan is referred to as "Concentrated Development" and would recover the estimated 20 to 25 trillion cubic feet (TCF) of natural gas in the PAPA. Under Alternative B, construction of new well pads, expansion of existing pads, and construction of new roads and pipelines would take place through 2023 whereas drilling would continue through 2025. It is estimated that wells would have a 40 year production life continuing through 2065. To provide more predictability during the development phase, the Proponents are proposing to develop a 10-year rolling forecast or development plan working with the BLM and WGFD. Each year, the Proponents would review these plans with the BLM and WGFD to seek improvements to the development plan in an attempt to further reduce impacts. Specific plans pertaining only to Alternative B include a Transportation Plan (Appendix 5B), Reclamation Plan (Appendix 8B), and Wildlife and Habitat Mitigation Plan (Appendix 9A).

The Proponents defined a "core area" (Alternative B Core Area) in the PAPA, mostly along the Anticline Crest, where the majority of development would occur (see Map 2.4-3). The Alternative B Core Area encompasses 43,624 acres (68.1 square miles), or 22 percent of the PAPA. Within the Alternative B Core Area, the Proponents have defined three Concentrated Development Areas (CDAs) that would move as pads are drilled out. Each of the three individual CDAs would not exceed 8 square miles; however, they would be tightly grouped and the combined area of the three would not exceed 19 square miles. The CDAs and their movement would leave large, contiguous blocks of land and corridors available for wildlife without active natural gas development activities. The Proponents provided examples of CDAs and how they could move from 2007 through 2011. Map 2.4-3 shows a composite of the three CDAs for 2007 through 2011. In other words, the three CDAs would most likely be somewhere in these three areas over the first 5 years, while adhering to the size restrictions stated above. The Proponents would attempt to fully develop each multi-well pad to the approved bottom-hole spacing before moving drilling rigs off of well pads. It is estimated that drilling rigs would move to a new pad an average of once per year. Pad reclamation would proceed as soon as practical when the last well on the pad is completed, reducing net disturbance as development proceeds. Interim reclamation would occur on well pads not scheduled for development activity within 2 years.

The northern-most portion of the PAPA contains mostly contiguous leases (currently held by Questar), unlike the central and southern portion, where many of the leases are in a checkerboard ownership pattern. CDA-1 (see Map 2.4-3) would be located in the northern portion of the PAPA in the Alternative B Core Area. Under Alternative B, CDA-1 would begin at the southern end of the leasehold currently held by Questar and would move north.


Map 2.4-3
Alternative B - Proposed Action
Example of Concentrated Development Areas
Pinedale
Boulder
353
T 33 N
T 32 N
T 31 N
T 30 N
T 29 N
R 110 W
R 109 W
R 108 W
R 107 W
CDA-1
CDA-2
CDA-3
191
351
Green River
New Fork River
Core Development Boundary
Concentrated Development Areas (CDAs)
CDA-1 Composite 2007 Through 2011
CDA-2 Composite 2007 Through 2011
CDA-3 Composite 2007 Through 2011
0 1 2 3 4 5 10 Miles
No warranty is made by the Bureau of Land Management
for use of the data for purposes not intended by the BLM
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The middle and southern portions of the PAPA contain leases that are held primarily by Shell and Ultra and are in a checkerboard ownership pattern in the Alternative B Core Area. Under Alternative B, Shell and Ultra propose to work together to develop their leases within CDA-2 and CDA-3. CDA-2 would initially be located at the southern boundary of CDA-1, essentially further concentrating the development. As leases are drilled out, CDA-2 would slowly move to the south. Shell and Ultra would work together to develop CDA-3 in the southern portion of the PAPA (see Map 2.4-3). CDA-3 would move to the south at approximately the same pace as CDA-2.

Delineation wells are proposed for the first 5 years (approximate) to assess production capabilities and ultimate well density required to develop their leases, both within and outside of the Alternative B Core Area. A portion of the delineation wells would be drilled on well pads with existing producing wells. Where possible, the delineation wells would be drilled in accordance with all seasonal restrictions for big game (pronghorn and mule deer) and greater sage-grouse. There may be some instances in the first 5 years where delineation wells must be drilled outside of the CDAs and outside of the Alternative B Core Area during the seasonally restricted periods. This would require an exception from BLM for development in big game (pronghorn and mule deer) and greater sage-grouse seasonal habitats during the seasonally restricted period. Once the estimated 5-year delineation period is over, all drilling in all seasons would be within the three CDAs. The well pads would be reclaimed to the size required for safe production operations.

All development drilling would be on consolidated well pads from which multiple wells would be drilled. Some delineation wells are planned to be drilled on new pads with one to three wells on the pad while other delineation wells would be drilled from existing producing pads. If commercially successful, small delineation pads would be expanded to accommodate additional wells (when they become part of a CDA); or the pads would be reclaimed if the wells are not commercially successful. Expansion of existing producing pads, by up to 21 acres, would be necessary to accommodate additional drilling.

Construction of ancillary facilities (compressor station expansions, CGFs, and gathering and sales pipelines) would take place both within and outside of the CDAs. Topsoil removal for well pads, roads, or other facility construction would not be conducted during frozen soil conditions. Development procedures for wellfield activities are provided in Appendix 7.

Production initiatives are proposed that are intended to result in better protection for big game and greater sage-grouse populations than what is currently afforded by the seasonal restrictions set forth in the PAPA ROD by lowering the amount and frequency of human presence year-round and throughout the production phase. One of these initiatives is the installation of a liquids gathering system in the central and southern portions of the PAPA, which would nearly eliminate trucking of produced water and condensate (see Appendix 7 for further description of the liquids gathering system). It would also allow for removal of some storage tanks on well pads that currently store condensate and produced water. Under Alternative B, the use of computer-assisted operations on multi-well pads would be expanded to reduce the number of daily visits by production personnel. New production from leases that have existing liquids gathering systems would be joined to the existing system. Shell and Ultra are proposing to install additional liquids gathering systems to transport condensate and produced water from their leases to CGFs. Production from delineation wells would be joined to the liquids gathering system, where possible, and placed within existing rights-of-way.

As part of Alternative B, the Proponents plan to implement Tier 2 equivalent emissions technology on all of their new drilling rig engines within 2 years after issuance of the ROD. Some drilling rig engines would continue to have higher emissions (i.e., Tier 0 and Tier 1);

however, these drilling rigs would be phased out after 2010. Of the 48 drilling rigs proposed by the end of 2009, 29 would have Tier 2 equivalent emission levels, 15 would have Tier 1 equivalent emission levels, and 4 would have Tier 0 equivalent emission levels.

Project Components. Estimated disturbance for each component under Alternative B is provided in Table 2.4-11. Estimates are provided for initial disturbance and LOP disturbance for each project component. Initial disturbance is defined as the amount of acreage that is disturbed at the time of construction and LOP disturbance is defined as the amount of disturbance remaining once reclamation has occurred.

Table 2.4-11
Estimated Initial and Life-of-Project Disturbance under Alternative B

Component	Number or Miles	Initial Disturbance (acres)	Life-of-Project Disturbance (acres)
Well Pads, Roads and Gas Gathering Pipelines			
Well Pads[1]	250 pads	8,113.0	3,245.2
Local and Resource Roads[2]	100 miles	606.0	484.8
Gas Gathering Pipelines[3]	100 miles	303.0	0.0
Liquids Gathering Pipelines[4]	471 miles	2,854.7	0.0
Subtotal		**11,876.7**	**3,730.0**
Trunk Pipelines and Ancillary Facilities			
30- to 42-inch Mesa Loop Lines[5]	15.3 miles	370.9	1.0
8-inch water line[6]	18.0 miles	109.1	0.5
12-inch liquids pipelines[7]	7.8 miles	47.3	0.5
Trunk lines – liquids gathering[8]	18 miles	163.6	0.5
Water Redistribution[4]	6 miles	36.0	0.5
Pipeline Interconnection	0.5 mile	3.0	0.5
Compressor Sites (expansion)	3 sites	110.0	110.0
Central Gathering Facilities	9 sites	90.0	90.0
Central Gathering Facilities	6 sites	12.0	12.0
Falcon Stabilizer Facility	1 site	20.0	20.0
Water Trucking Facility	1 site	20.0	20.0
Water Trucking Facility	1 site	7.0	7.0
Falcon Truck Unloading	1 site	15.0	15.0
Expand Stabilizer Site	1 site	5.0	5.0
Subtotal		**1,008.9**	**282.5**
Total Wellfield Components		**12,885.6**	**4,012.5**

[1] Disturbance includes new well pads and expansion of existing well pads. LOP disturbance assumes 60 percent reclamation of well pads.
[2] Assumes no new collector roads would be built within the PAPA, assumes 0.4 mile of road per new pad with a construction right-of-way of 50 feet. LOP disturbance assumes 20 percent reclamation of roads.
[3] Assumes 0.4 mile of gas gathering pipeline per new well pad with a construction right-of-way of 25 feet.
[4] Estimate for miles of proposed liquids gathering pipelines is based on data provided by the Proponents.
[5] Disturbance is based on 200-foot construction right-of-way width. Includes two co-located 30- to 42-inch gas pipelines from Stewart Point to Pinedale/Gobblers Knob Compressor Station. Includes 30.6 miles of pipeline but because they are co-located, 200-foot construction right-of-way is 15.3 miles. The two pipelines would be built at separate times.
[6] Disturbance is based on 50-foot construction right-of-way width from Stewart Point area to Highway 351.
[7] Disturbance is based 50-foot construction right-of-way width. Includes one 12-inch crude petroleum pipeline and one water pipeline from 4-way area to Paradise Compressor Station.
[8] Disturbance is based on 75-foot construction right-of-way width.

In their long-term development plan, the Proponents provided estimates for the number of new and expanded pads by year, and the estimated disturbance associated with well pad construction through 2023. Estimates for disturbance associated with roads and gas gathering pipelines were determined using factors for existing gas gathering pipelines and roads per well pad. Disturbance estimates for expansion of the existing liquids gathering system, construction

of the proposed liquids gathering system, and for construction of trunk pipelines and ancillary facilities, were either provided by the Proponents or were factored based on the proposed disturbance. The initial and LOP surface disturbance under Alternative B is 12,885.6 acres and 4,012.5 acres, respectively (see Table 2.4-11).

Wells and Drilling Rigs. The Proponents estimate that all surface disturbance (roads, gathering pipelines, and well pad construction) would be complete by 2023, with drilling continuing through 2025. Table 2.4-12 shows the estimated number of wells drilled, new well pads, and drilling rigs under Alternative B by year. At the end of 2025, there would be approximately 4,399 additional wells drilled in the PAPA under Alternative B. Table 2.4-12 shows that there is an initial increase in estimated drilling rigs (from 26 in November 2006) in the PAPA, peaking in 2009 with 48 rigs. The estimated rig number stabilizes at 45 before it begins to decline as Operators have drilled out their leases. The Proponents are proposing that the most wells drilled in any one year would be about 305. The number of wells drilled per year also begins to decline as leases are drilled out. The number of proposed wells is an estimate based on proposed drilling rigs and current drilling.

Table 2.4-12
Estimated Wells, New Well Pads,
and Drilling Rigs by Year for Alternative B

Year	Wells	New Well Pads	Drilling Rigs
2007	268	44	35
2008	299	36	45
2009	305	37	48
2010	291	29	45
2011	290	33	45
2012	289	13	45
2013	288	15	45
2014	287	11	45
2015	287	12	45
2016	286	12	45
2017	282	8	44
2018	279	0	43
2019	213	0	35
2020	187	0	28
2021	177	0	26
2022	143	0	21
2023	112	0	19
2024	107	0	16
2025	9	0	3
Total	**4,399**	**250**	

Well Pads. Alternative B includes development that utilizes consolidated well pads on a wide-scale throughout the PAPA. Therefore, the sequence described in the PAPA DEIS (BLM, 1999a) is no longer applicable. The majority of the new wells would be drilled from existing well pads that may require expansion by up to 21 acres, but no new access roads, gas gathering pipelines, or water wells would be required for the existing well pads. Some wells would be drilled from new well pads that may become expansion pads. The new well pads would require a new access road, gas gathering pipelines, and a water supply well if the wells are successful.

Alternative B includes up to 4,399 additional wells in the PAPA between 2007 and 2025. It is estimated that to drill these wells, 250 new well pads would be required. In all, the total number of well pads in the PAPA in 2023 is expected to be 590, the sum of 340 existing pads in 2005 and 250 new well pads under Alternative B.

By 2023, the initial disturbance estimate for 250 well pads is 8,113.0 acres, with a LOP disturbance estimate of 3,245.2 acres (Table 2.4-11). The Proponents have prepared a Reclamation Plan which is provided as Appendix 8B. Under the Plan, initial disturbance associated with well pads would be reclaimed to a LOP disturbance of 40 percent (i.e., only 40 percent of the initial disturbance on a pad would remain, once development is complete).

Roads and Gathering Pipelines. Under Alternative B, it is assumed that there would be no additional construction of collector roads in the PAPA. Assuming 0.4 mile of local or resource road per new well pad (based on the current level of development), there would be 100.0 miles of local and resource roads constructed in the PAPA by 2023, for an initial disturbance of 606.0 acres. The LOP disturbance would be 484.8 acres, assuming that 20 percent of the initial road disturbance would be reclaimed within one growing season after construction (see Table 2.4-11). Using a similar assumption for gas gathering pipelines, there would be 100.0 miles of gas gathering pipelines by 2023 for an initial disturbance of 303.0 acres. There is no LOP disturbance associated with construction of gas gathering pipelines because the entire disturbance is reclaimed after construction.

Currently, condensate and produced water are trucked from the central and southern portions of the PAPA. The Proponents are proposing to install an additional 471 miles of liquids gathering pipelines by 2023. The liquids gathering system would disturb 2,854.7 acres and would include continuation of the liquids gathering system in leases currently held by Questar and a new liquids gathering system in leases currently held by Shell and Ultra. The liquids gathering system would most likely be connected to the pipeline that delivers crude petroleum to the processing facilities. Produced water would be collected at truck unloading facilities and transported to various commercial water disposal locations.

Trunk Pipelines. In addition to the trunk pipelines described in Section 2.4.2.1 (Components Common to All Alternatives), JGGC is proposing to install two 7.8-mile long, 12-inch liquids pipelines from the 4-way area to the Paradise Compressor Station, with an initial disturbance of 47.3 acres (assuming a 50-foot construction right-of-way). This disturbance would occur adjacent to or within existing rights-of-way for most of the route.

JGGC is also proposing to install an 18-mile long liquids trunk line (163.6 acres), 6 miles of water redistribution pipelines (36.0 acres), and a 0.5-mile pipeline interconnection (3.0 acres) in support of the new liquids gathering system.

Ancillary Facilities. Several ancillary facilities, including expansion of existing facilities, are proposed.

Compressor Stations. In addition to the compression and new disturbance included in Section 2.4.2.1 (Components Common to All Alternatives), QGM is proposing to install an additional 15,500 hp of compression which would require an additional 20 acres of disturbance at the Pinedale/Gobblers Knob Compressor Station in 2015. Combined, Alternative B includes 282,538 hp of new compression and 110 acres of disturbance, all to be located at existing compressor stations.

Central Gathering Facilities. In addition to the CGFs included in Section 2.4.2.1 (Components Common to All Alternatives), JGGC is proposing to construct nine CGFs in support of the liquids gathering system within leases currently held by Shell and Ultra. The CGFs require 10 acres each, for a total initial and LOP disturbance of 90 acres.

Stabilizer Facilities. In support of the new liquids gathering system, JGGC is proposing to build a stabilizer facility at the Falcon Compressor Station that would require an additional 20 acres of initial and LOP disturbance. The purpose of the stabilizer is to make a “stable” product (crude

petroleum) that can be metered, and it then would be sent to the pipeline for transport off the PAPA.

Water Truck Unloading Facilities. In addition to facilities described in Section 2.4.2.1 (Components Common to All Alternatives) and in support of the new liquids gathering system, JGGC is proposing to install truck unloading facilities near Highway 351. This would require an initial and LOP disturbance of 20 acres.

Options to eventually pipe, rather than truck, the produced water collected at the truck unloading facilities are in the preliminary investigation phases. One option would be to build pipeline spurs from the truck unloading facility to the nearby evaporation facilities operated by Anticline Disposal. Another option would be to construct a water disposal pipeline running from the truck unloading facility to produced water injection wells in the PAPA or to the Big Piney Water Disposal Facility located approximately 35 miles southwest of the PAPA.

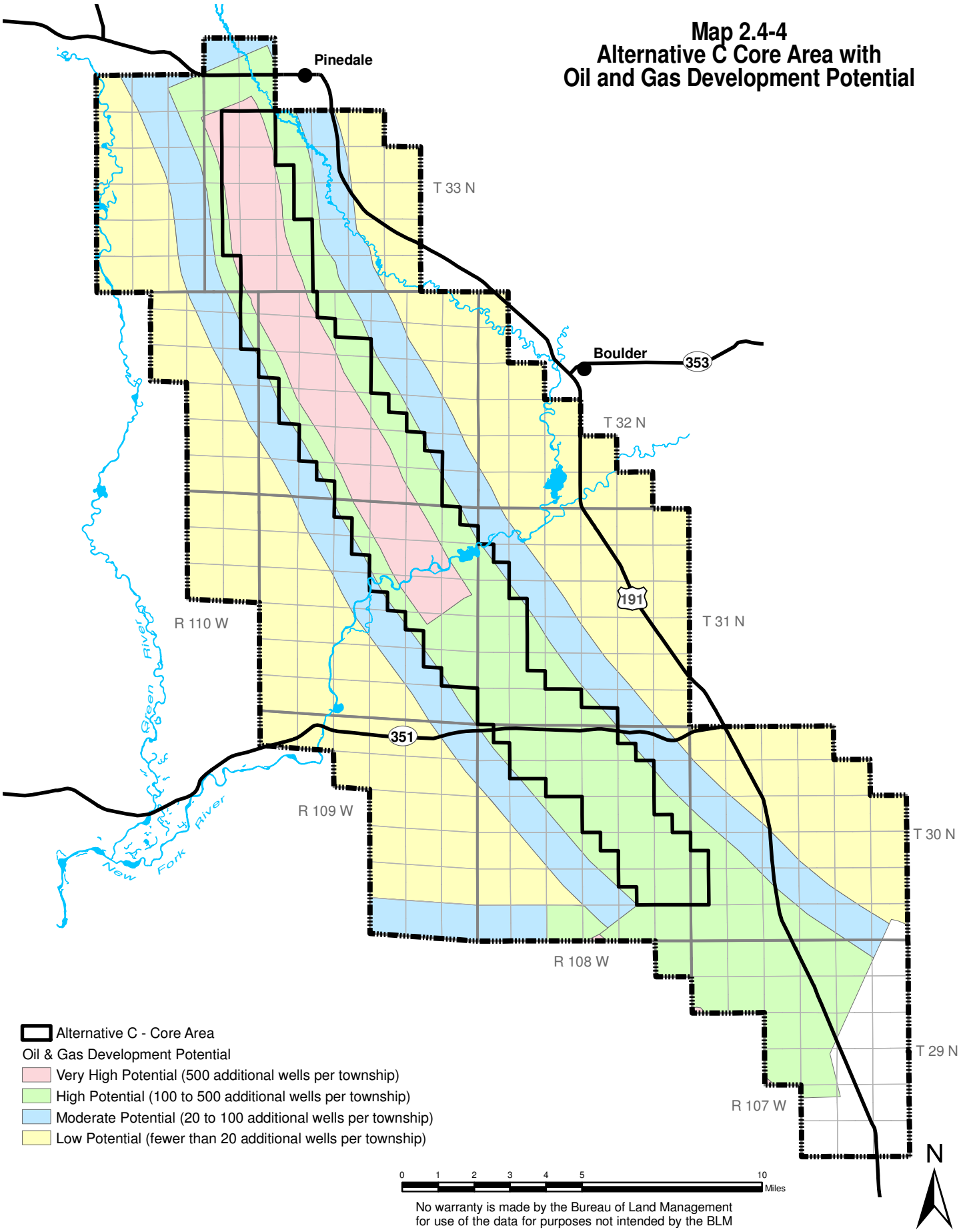
2.4.2.4 Alternative C

Alternative C is similar to Alternative B with respect to the following and includes:

- all project components described for Components Common to All Alternatives (Section 2.4.2.1) and Alternative B (Table 2.4-11);
- the Development Procedures for Wellfield Activities (Appendix 7) and Pipeline Design and Construction Procedures; (Appendix 6);
- a total of 4,399 additional wells drilled by the end of 2025 (Table 2.4-12);
- air quality impact analysis based on a peak of 48 drillings rigs operating in the PAPA, leveling off to 45 rigs after 2010 (Table 2.4-12);
- installation of a liquids gathering system in the central and southern portions of the PAPA (Table 2.4-11);
- 250 additional well pads totaling 535 well pads for LOP since the PAPA ROD (Table 2.4-11); and
- additional initial disturbance of 12,885.6 acres and LOP disturbance of 4,012.5 acres (Table 2.4-11).

Although Alternative C is similar to Alternative B in that it includes the same project components, geographically it is different from Alternative B. That is, rather than only specifying certain areas where year-round development could occur, Alternative C specifies areas where year-round development would **not** occur. It includes a core area (Alternative C Core Area on Maps 2.4-4 and 2.4-5) that is smaller than the Alternative B Core Area (Map 2.4-3). The overall objective of Alternative C is to control spatial disturbance over time maximizing development in some areas while minimizing development in other areas, especially in portions of big game seasonal habitats. Specific plans that apply to Alternative C include the Transportation Plan (Appendix 5C), Reclamation Plan (Appendix 8C), and Wildlife Habitat and Mitigation Plan (Appendix 9B).

The Alternative B Core Area was defined by the Proponents and was based on the success of development to date and projections for success in future development. The Alternative C Core Area is based on BLM's Reservoir Management Group (RMG) projections for potential development in the PAPA (see Map 2.4-4). The United State Geological Survey - USGS


Map 2.4-4
Alternative C Core Area with
Oil and Gas Development Potential
Pinedale
Boulder
353
191
351
T 33 N
T 32 N
T 31 N
T 30 N
T 29 N
R 110 W
R 109 W
R 108 W
R 107 W
Green River
New Fork River
Alternative C - Core Area
Oil & Gas Development Potential
Very High Potential (500 additional wells per township)
High Potential (100 to 500 additional wells per township)
Moderate Potential (20 to 100 additional wells per township)
Low Potential (fewer than 20 additional wells per township)
0 1 2 3 4 5 10
Miles
N
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(Crockett et al., 2003) has defined "Very High Potential Areas", "High Potential Areas", "Moderate Potential Areas", and "Low Potential Areas" for development of the Pinedale Anticline as follows:

- Very High Potential Area – defined as a 1.5-mile wide band lying on the Pinedale Anticline axis including all acres 1 mile east and 0.5 mile west of the anticlinal axis with a northwest and southeast limit. This area would include over 500 additional wells per township (approximately 36 square miles).
- High Potential Area – defined as a 3-mile wide band lying on the Pinedale Anticline axis including all acres 2 miles east and 1 mile west of the anticlinal axis with a northwest and southeast limit. This area would include 100 to 500 additional wells per township.
- Moderate Potential Area – defined as a 5-mile wide band lying on the Pinedale Anticline axis including all acres 3 miles east and 2 miles west of the anticlinal axis with a northwest and southeast limit. This area would include 20 to 100 additional wells.
- Low Potential Area – includes all other areas in the PAPA and beyond. This area would include fewer than 20 additional wells per township.

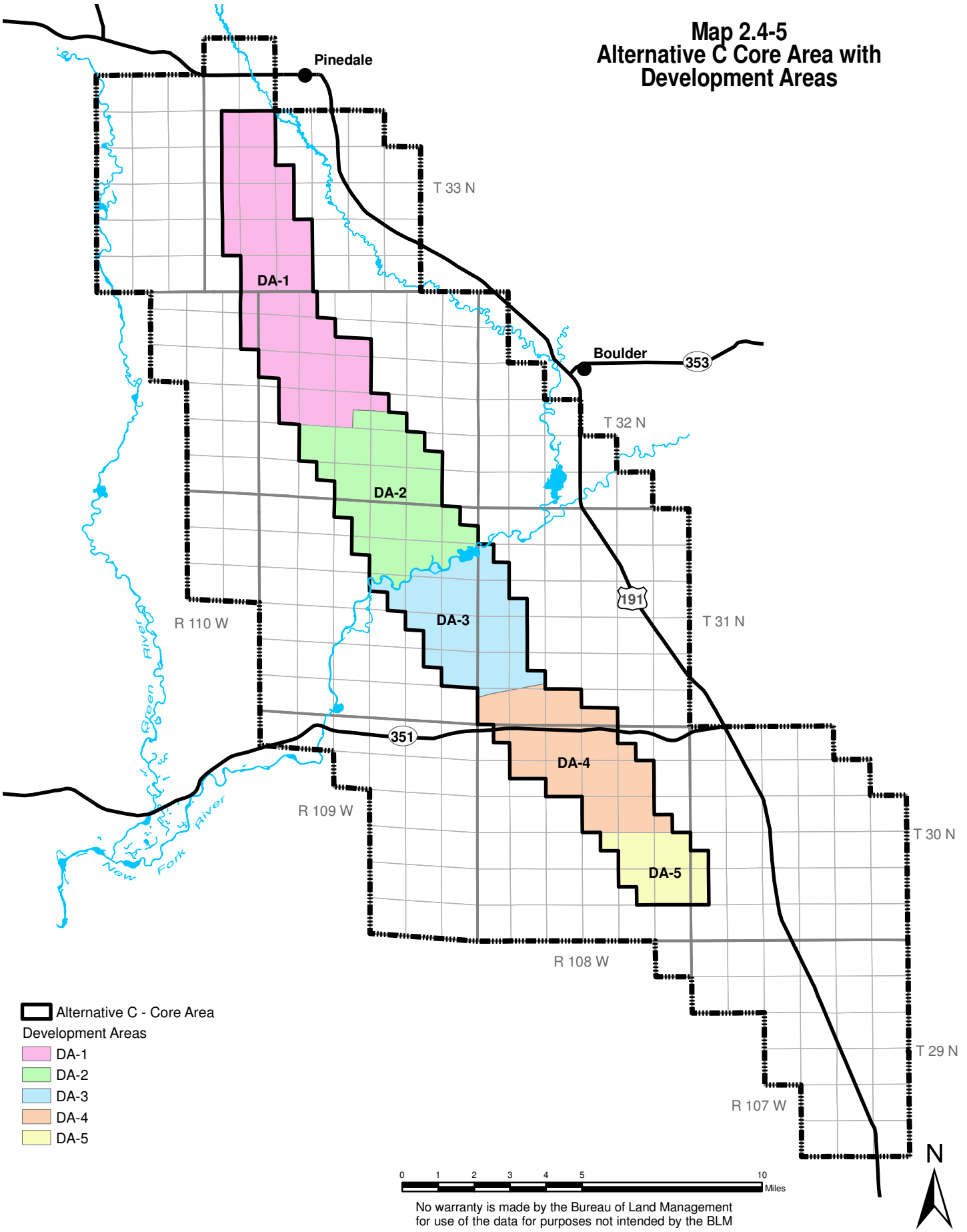
The Very High, High, Moderate, and Low potential areas are shown on Map 2.4-4. For Alternative C, the core area is defined as the Very High and High potential areas. Approximately 39,678 acres (62.0 square miles) are included in the Alternative C Core Area. This area is 20 percent of the PAPA and is smaller than the Alternative B Core Area (22 percent of the PAPA).

Alternative C includes five Development Areas (DAs), each with a fixed location unlike the CDAs of Alternative B. Year-round development would be allowed in four of the DAs (1 through 4) with exception for seasonal restrictions in big game (pronghorn and mule deer) and greater sage-grouse seasonal habitats, during the seasonally restricted periods (Map 2.4-5). For year-round development, in all DAs except for DA-5, Operators would be required to fully develop each existing and/or new well pad in one continuous time span for as long as necessary to drill and complete all wells on the pad. Once an Operator has determined that a well pad has been fully developed, they would not be allowed to reinitiate development on the well pad. Once a well pad has been fully developed, full site restoration and reclamation would begin as soon as the ground is not frozen and would be completed before the onset of winter. These elements of Alternative C would not apply in DA-5 because Operators would not be able to fully develop well pads due to seasonal restrictions in greater sage-grouse seasonal habitats.

Seasonal restrictions would apply to new surface disturbing activities in all areas outside of the Alternative C Core Area. Development activities would be allowed in all DAs and outside of the Alternative C Core Area at any time with adherence to seasonal restrictions.

In all areas of the PAPA, Operators would be required to expand existing well pads before constructing new well pads. Operators would be allowed to develop from all existing well pads in a quarter-section (approximately 160 acres or 0.25 square mile). If there are no existing well pads in a quarter-section, Operators would be allowed to develop one new well pad. Additional well pads in the quarter-section may be considered by BLM on a case-by-case basis for circumstances such as topographical constraints. Most new producing wells would be required to be connected to a liquids gathering system. Outside of the seasonally restricted periods, Operators would not be required to completely develop pads and could return to the pad in the future.

Operators would be required to comply with the Reclamation Plan (Appendix 8C) to fully stabilize sites immediately. Each DA has specific requirements for development as follows:


Map 2.4-5
Alternative C Core Area with Development Areas
Pinedale
Boulder
353
191
351
T 33 N
T 32 N
T 31 N
T 30 N
T 29 N
R 110 W
R 109 W
R 108 W
R 107 W
DA-1
DA-2
DA-3
DA-4
DA-5
Green River
New Fork River
Alternative C - Core Area
Development Areas
DA-1
DA-2
DA-3
DA-4
DA-5
0 1 2 3 4 5 10 Miles
N
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- DA-1 – this is the northern-most DA, includes mostly contiguous leases currently held by Questar, is entirely within big game crucial winter ranges, and overlaps portions of 2-mile buffers associated with several greater sage-grouse leks. The total area in DA-1 is 12,644 acres. The southern boundary of DA-1 is the approximate boundary of Questar's leases (Map 1.1-2 in Chapter 1) and the Shell/Ultra checkerboard patterned leases to the south (DA-2). The east-west boundaries of DA-1 are defined by the Alternative C Core Area (Map 2.4-5). Year-round development would be allowed in DA-1 with specific limitations.

  Initial year-round development would be restricted to a 2-mile wide area (south to north) beginning at the southern boundary of DA-1. As initial development is completed, the 2-mile wide area would move north. Development activities would not be able to advance to the north until the southern initial development is completed and final reclamation measures have been initiated. As development moves to the north, year-round activities would continue to be confined to a 2-mile wide area (south to north). It is assumed that by the time the 2-mile wide drilling area reaches the northern-most portion of DA-1, the southern-most portion would have achieved a self-replicating vegetative community functioning at a pre-disturbance level. The pattern of development moving north while reclamation is initiated to the south would continue until DA-1 is fully developed. Once final reclamation has been initiated, no new development would occur in the areas to the south of the ongoing development.

  Development could occur in all areas of DA-1 outside of the seasonally restricted periods except for areas that have been fully developed. Such development could include expansion of existing pads and construction of new consolidated pads, single well delineation pads, roads, gathering pipelines and ancillary facilities.

- DA-2 – this DA is located north of the New Fork River in the central portion of the PAPA, is mostly within big game crucial winter ranges, and overlaps portions of 2-mile buffers associated with several greater sage-grouse leks. The total area included in DA-2 is 8,903 acres. The northern boundary of DA-2 is the southern boundary of DA-1. The southern boundary of DA-2 is the New Fork River. The east-west boundaries of DA-2 are defined by the Alternative C Core Area. Year-round development would be allowed in DA-2 with specific limitations.

  Year-round development would be allowed in all areas of DA-2 upon issuance of the ROD, and lasting until DA-2 is entirely developed. Once DA-2 is entirely developed, no new development would be allowed to occur in DA-2 during any season for the remaining life of the project.

- DA-3 – this is located south of the New Fork River in the central portion of the PAPA and is mostly within big game crucial winter ranges and includes 7,127 acres. The northern boundary of DA-3 is the New Fork River and the southern boundary is the southern border of the 0.25-mile buffer on the Lander Trail. East-west boundaries of DA-3 are defined by the Alternative C Core Area.

  Year-round development would be allowed to occur in all areas of DA-3. However, year-round development would not begin in DA-3 until all development is complete in DA-2. Development could occur in all areas of DA-3 outside of the seasonally restricted periods upon issuance of the ROD.

- DA-4 – this is located in the southern portion of the PAPA. There is a small portion of big game crucial winter ranges that coincide with DA-4 and the majority of DA-4 is within 2 miles of several greater sage-grouse leks. The total area for DA-4 is 7,964 acres. The

northern boundary of DA-4 is the southern border of the 0.25-mile buffer on the Lander Trail. The southern boundary of DA-4 was defined by the BLM ID Team to be approximately 1.0 mile from the nearest greater sage-grouse lek that is associated with the Yellow Point Lek Complex. The boundary is defined by Sections 13, 14, and 15 to the north and Sections 22, 23, and 24 to the south, all of which are in T. 30 N., R. 108 E. East-west boundaries of DA-4 are defined by the Alternative C Core Area.

Year-round development would be allowed in all areas of DA-4 beginning in 2007 and lasting until DA-4 is entirely developed. Once DA-4 is entirely developed, no new development would be allowed to occur.

- DA-5 – this southernmost DA extends south from the border with DA-4 and includes 3,040 acres. All of DA-5 is within 2 miles of at least one greater sage-grouse lek in the Yellow Point Lek Complex. None of DA-5 coincides with big game crucial winter ranges. The southern boundary of DA-5 is the northern boundary of the Jonah Field Project Area. East-west boundaries of DA-5 are defined by the Alternative C Core Area. Year-round development would not be allowed in DA-5. All development would comply with seasonal restrictions for greater sage-grouse seasonal habitats.

Proposed project components and estimates of initial and LOP disturbance under Alternative C are the same as those provided in Table 2.4-11 for Alternative B. The initial disturbance under Alternative C is estimated to be 12,885.6 acres, with a LOP disturbance of 4,012.5 acres. The estimates used under Alternative C, including the number of wells to be drilled, the number of drilling rigs required, the volume of associated traffic and the size of the required workforce, are the same as those described for Alternative B.

2.4.3 Alternative D

Based upon public comments received on the Draft SEIS (BLM, 2006a), the BLM has developed Alternative D. Alternative D was created, in part, by comments from the Proponents (Ultra, Shell, Questar, BP, Stone/Newfield, Yates, and Anschutz), the WGFD, and WDEQ - Air Quality Division (WDEQ-AQD).

Alternative D is similar to Alternatives B and C with respect to the following and includes:

- all project components described for Components Common to All Alternatives, Alternative B, and Alternative C (Table 2.4-11);
- the Development Procedures for Wellfield Activities (Appendix 7) and Pipeline Design and Construction Procedures (Appendix 6);
- a total of 4,399 additional wells drilled by the end of 2025 (Table 2.4-12);
- air quality impact analysis based on a peak of 48 drillings rigs operating in the PAPA, leveling off to 45 rigs after 2010 (Table 2.4-12);
- installation of a liquids gathering system in the central and southern portions of the PAPA (Table 2.4-11);
- 250 additional well pads totaling 535 well pads for LOP since the PAPA ROD (Table 2.4-11); and
- additional initial disturbance of 12,885.6 acres and LOP disturbance of 4,012.5 acres.

Similar to Alternative C, Alternative D includes a core area (the Alternative D Core Area) and Development Areas 1 through 5. Alternative D is unique with respect to the following and includes:

- expansion of DA-1 and DA-2 (and therefore the core area) to include leases currently held by Anschutz;
- expansion of the DA-5 core area as proposed in the Proponents' comments on the Draft SEIS;
- a PDA surrounding the Alternative D Core Area;
- allowance for delineation beyond that allowed in Alternative C;
- exception for seasonal wildlife restrictions in DA-5;and
- a 0.75-mile PDA buffer area outside of the 0.25-mile NSO for five designated occupied greater sage-grouse leks.

Ultra, Shell, and Questar have committed to mitigation measures which are included as part of Alternative D. They are described in Appendix 11 and summarized below:

- concentrated development (simultaneous construction, drilling, completion, and production);
- directional drilling from multi-well pads;
- liquids gathering systems;
- computer-assisted operations;
- emission reductions in NO_x to 2005 levels within 1 year and an additional 80 percent reduction within 42 months;
- wildlife monitoring and mitigation matrix with objectives and sequential outcomes (Appendix 10);
- annual planning and 10-year rolling forecast;
- federal suspended and term NSO leases (49,903 acres); and
- expected $36 million mitigation and monitoring fund.

Anschutz, BP (Stone/Newfield), and Yates have committed to the following mitigation measures which are included as part of Alternative D as follows:

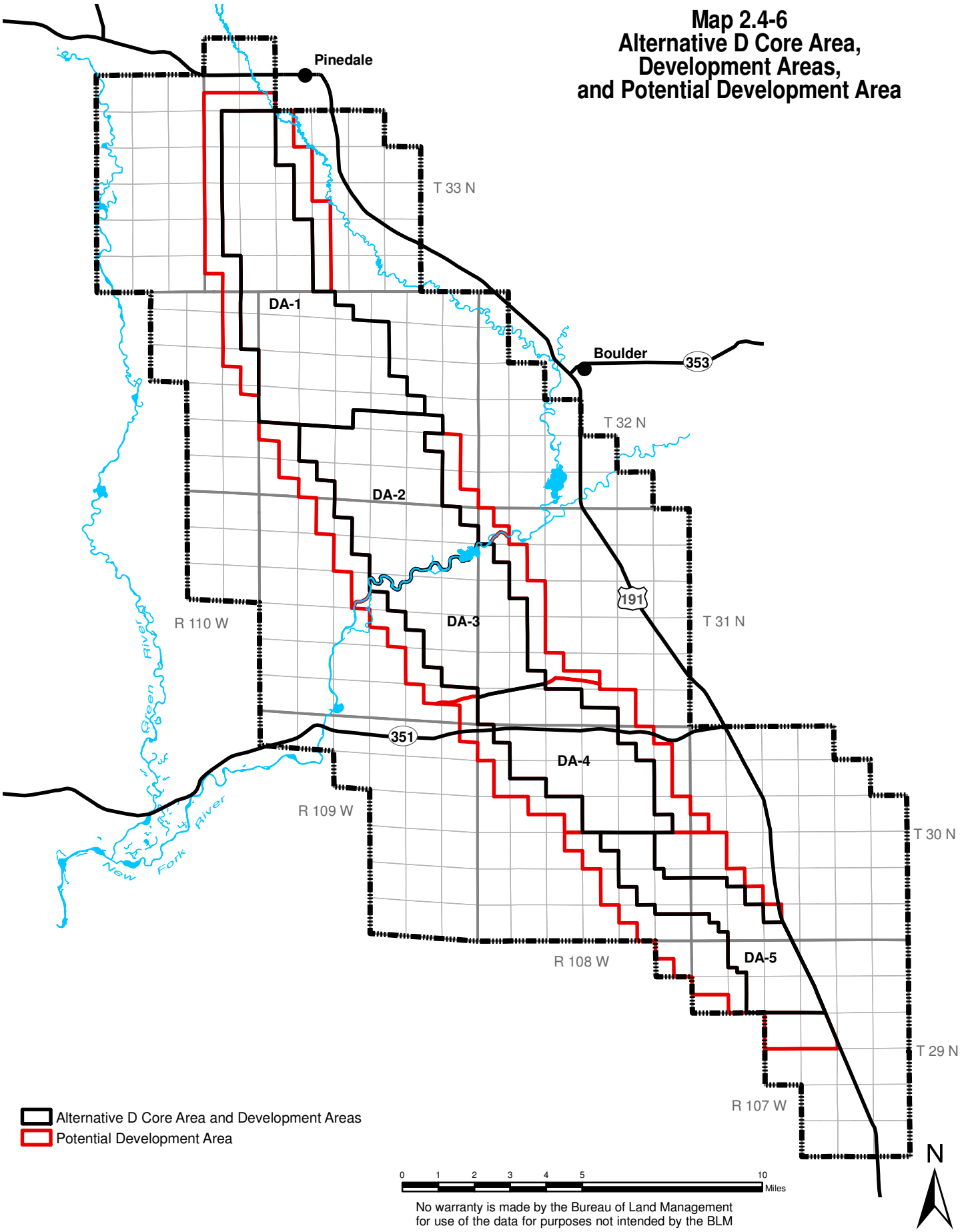
- concentrated development (simultaneous drilling and completions); and
- directional drilling from multi-well pads.

2.4.3.1 Alternative D Core Area

The Alternative D Core Area includes 45,415 acres or 23 percent of the PAPA as shown on Map 2.4-6. This is an expansion of the Alternative C Core Area by 14.4 percent. Based on comments received on the Draft SEIS (BLM, 2006a), the Alternative C Core Area boundary has been expanded to the east, along the DA-1 and DA-2 eastern edges to form the Alternative D Core Area. Under Alternative D, DA-1 and DA-2 include 14,872 acres and 9,222 acres, respectively, to allow for year-round development within leases currently held by Anschutz, all within mule deer crucial winter range.

The Alternative C Core Area has been narrowed and elongated in DA-5 to continue the Alternative D Core Area south of the Alternative C Core Area and now includes 6,230 acres. Year-round development with exception for seasonal restriction in big game (pronghorn and mule deer) and greater sage-grouse seasonal habitats would be allowed in the entire Alternative D Core Area.

Map 2.4-6
Alternative D Core Area, Development Areas, and Potential Development Area



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2.4.3.2 Alternative D Potential Development Area

Alternative D contains 24,875 acres adjacent to the Alternative D Core Area which would be potentially open for year-round development. This area is referred to as the Potential Development Area or PDA. The PDA adjacent to DA-1 (PDA-1 - 5,370 acres) and DA-2 (PDA-2 - 3,845 acres) is generally a 0.5-mile buffer around the Alternative D Core Area. On a portion of the east side of DA-1 and DA-2, there is no PDA because the DAs were expanded to allow for year-round development within leases currently held by Anschutz. PDA-3 (3,625 acres) and PDA-4 (4,532 acres) include a 0.5-mile buffer surrounding the Alternative D Core Area. PDA-5 includes 7,503 acres and is greater than the 0.5-mile buffer that surrounds other portions of the Alternative D Core Area.

Year-round development would not initially be allowed within the PDA. The need for year-round development within the PDA would be determined by the success of delineation drilling. Requests by the Operators for expansion of year-round development into the PDA would be reviewed in the Annual Planning Meeting, the Adaptive Management Process proposed under this Alternative. Depending on the outcome, year-round development may be allowed within the PDA if approved by the BLM AO with the intention of reducing the likelihood of a second development pass through caused by adherence to seasonal restrictions for wildlife. For the purpose of the analysis contained in Chapter 4, it is assumed that year-round development would occur in the PDA.

2.4.3.3 Alternative D Development Areas

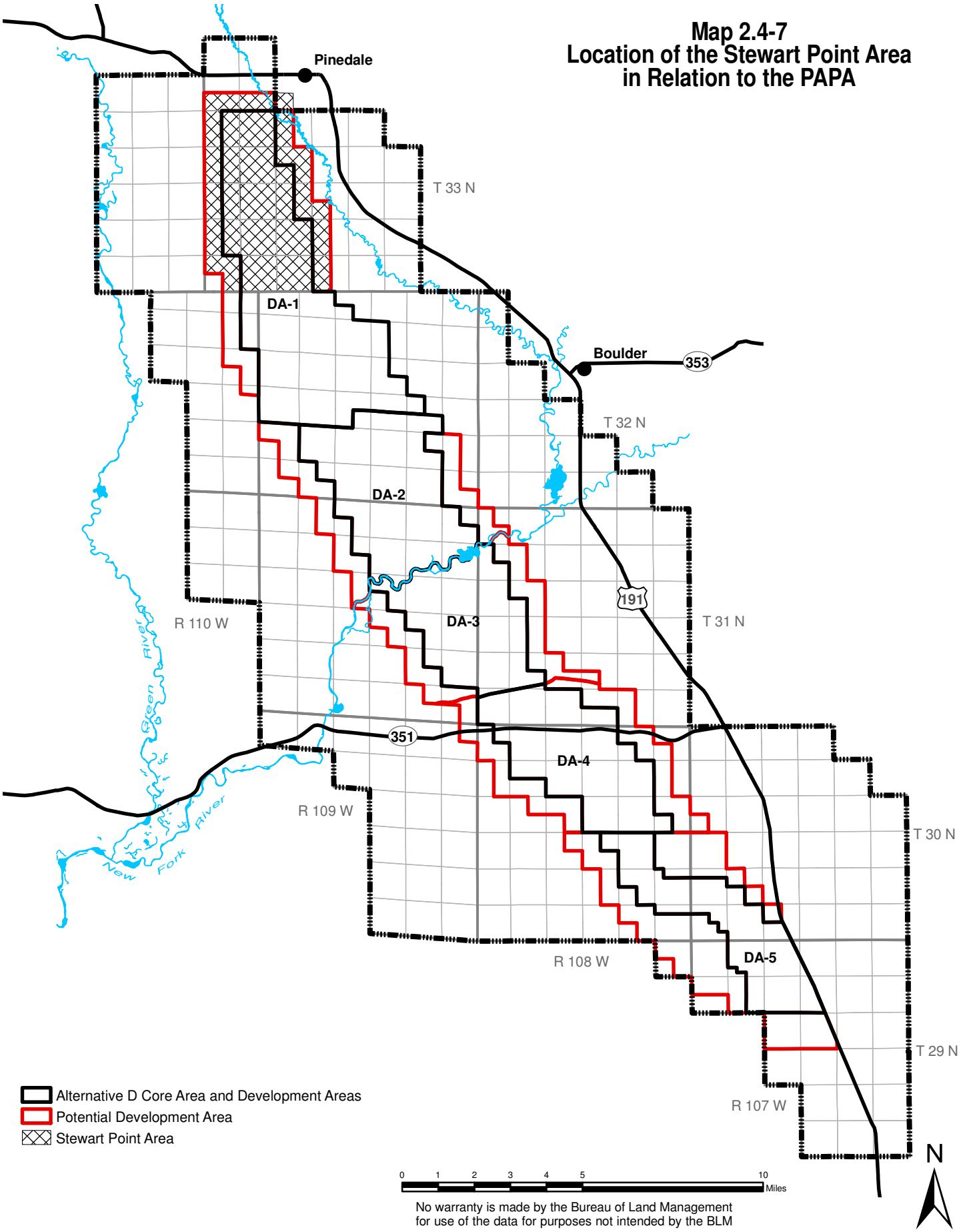
Development Area 1

Development in DA-1. Under Alternative D, DA-1 includes 14,872 acres and has the potential for expansion within PDA-1 (5,370 acres). DA-1 is the northern-most DA, and includes mostly contiguous leaseholds currently held by Questar as well as acreage under lease to Ultra, Shell, and Anschutz. DA-1 is entirely within big game crucial winter ranges and overlaps portions of 2-mile buffers associated with occupied greater sage-grouse leks. The east-west boundaries of DA-1 have the potential to be expanded to include all or a portion of the adjacent PDA, thereby expanding the Alternative D Core Area. Year-round development with exception to seasonal restrictions for big game (pronghorn and mule deer) and greater sage-grouse would be allowed in DA-1 and the associated PDA with specific limitations as described below.

Following an estimated 24-month transition period after issuance of a ROD, Questar would begin concentrated year-round development in DA-1 proceeding from south to north. Questar's development in DA-1 would be within a contiguous 6 square mile area. A decision regarding the movement and shape of the 6-square mile area would be made by the BLM AO. Consequently, DA-1 is not open in its entirety to year-round development. The 6 square mile area would be no more than 2 miles in north-south extent except when the 6 square miles cannot be maintained due to narrowing of DA-1 in the east-west direction. Recommendations for the shape and location of the 6 square mile area for each subsequent year after signing of the ROD would be reviewed during the Annual Planning Meeting and determinations would require the approval of the BLM AO.

Approximately 1,111 acres within DA-1 are leased by Anschutz. In a proposal to BLM, Anschutz agreed to limit development within the Alternative D Core Area to no more than three drilling rigs and three well pads at any given time. Year-round development with exception to seasonal restrictions for big game and greater sage-grouse seasonal habitats would be allowed at any time within the Anschutz leases in DA-1.

Delineation in DA-1. Delineation drilling in the Stewart Point area (see Map 2.4-7) would be conducted during the first 2 years following the ROD, while adhering to seasonal restrictions for wildlife. Questar's proposed delineation would consist of 22 wells on nine well pads (two new


Map 2.4-7
Location of the Stewart Point Area
in Relation to the PAPA
Pinedale
T 33 N
DA-1
Boulder
353
T 32 N
DA-2
191
R 110 W
DA-3
T 31 N
Green River
351
DA-4
R 109 W
New Fork River
T 30 N
R 108 W
DA-5
T 29 N
R 107 W
Alternative D Core Area and Development Areas
Potential Development Area
Stewart Point Area
0 1 2 3 4 5 10
Miles
N
No warranty is made by the Bureau of Land Management
for use of the data for purposes not intended by the BLM

well pads). Beyond the 2 years following the ROD, delineation within the Stewart Point area that requires new pads or roads (both inside the Alternative D Core Area and PDA) would only take place either 1 mile or 18 months ahead of the 6 square mile area of development. After 2 years following a ROD, no additional pads for delineation would be allowed unless recommended during the Annual Planning Meeting and approved by the BLM AO. If it is determined that an extended delineation period is necessary in DA-1, it would be recommended during the Annual Planning Meeting and would require approval from the BLM AO.

Development Area 2

Development in DA-2. DA-2 includes 9,222 acres and has the potential for expansion within PDA-2. DA-2 is located north of the New Fork River in the central portion of the PAPA, is mostly within big game crucial winter ranges and overlaps portions of 2-mile buffers associated with several greater sage-grouse leks. The east-west boundaries of DA-2 are defined by the Alternative D Core Area. Year-round development would be allowed within DA-2 immediately following issuance of the ROD. After a 24-month transition period, concentrated development would begin in DA-2. Development would be concentrated by forming two groups of drilling rigs; one at the southern boundary of DA-2 in the area immediately adjacent to the New Fork River and one at the northern boundary of DA-2 just to the south of DA-1. Development in DA-2 would progress with the drilling rig groups moving toward the center of DA-2 from both the north and south ends of DA-2.

Anschutz leases 199 acres of federal minerals in DA-2. Under Alternative D, Anschutz would be able to conduct year-round development with exception to seasonal restrictions for big game and greater sage-grouse seasonal habitats within their leases in DA-2 and would not be subject to the drilling rig grouping discussed above.

Delineation in DA-2. Delineation would be allowed in DA-2 with exception to seasonal restrictions for big game and greater sage-grouse in seasonal habitats; however, seasonal restrictions would apply for delineation in PDA-2. Year-round development in PDA-2 would be subject to recommendation during the Annual Planning Meeting and would require approval from the BLM AO.

Development Area 3

Development in DA-3. DA-3 includes 7,127 acres and has the potential for expansion into PDA-3 (3,625 acres). DA-3 is located south of the New Fork River in the central portion of the PAPA and is mostly within big game crucial winter ranges. The east-to-west movement of development in DA-3 is intended to provide maximum amounts of undisturbed pronghorn crucial winter range and movements.

Year-round development would begin in DA-3 once drilling and completion are finished within a 2-mile band at the southern end of DA-2, north of the New Fork River (see Map 2.4-6). As drilling and completion diminish in DA-2, development could increase proportionately in DA-3. Development in DA-3 with concentrated drilling rigs would progress from south to north and would occur in Range 109 W. until DA-2 drilling and completions are finished. The location and concentration of drilling rigs in DA-3 would be reviewed during the Annual Planning Meeting and revisions in movement and locations would require approval from the BLM AO.

When drilling and completions are finished in DA-2, development could expand to the north end of DA-3 along the range line between Range 108 W. and Range 109 W. and would move to the west occupying Shell and Ultra's leases. The development would continue westward to the DA-3 western boundary and could move into PDA-3 based on recommendations during the Annual Planning Meeting; however, it would require approval from the BLM AO.

After drilling and completions are finished in Range 109 W., eastward development into Range 108 W. would continue to the DA-3 eastern boundary and could occur into PDA-3 if recommended during the Annual Planning Meeting and approved by the BLM AO.

Delineation in DA-3. Delineation would be allowed in DA-3 within the Alternative D Core Area with exception to seasonal restrictions for big game; however, seasonal restrictions for greater sage-grouse would apply. The delineation activity within these parameters may be expanded to PDA-3 based on review and recommendations during the Annual Planning Meeting and approval of the BLM AO.

Delineation would occur in two phases. Phase 1 delineation would begin (after the 24 month transition period) upon issuance of the ROD and would occur on a north-south line in the western-most portion of Range 108 W. It would extend from the south boundary of DA-3 to the north boundary of DA-3 generally occurring within a 1.5 mile-wide area (east-west) at any time. Delineation would then proceed to the east along north to south line toward the east boundary of DA-3 and potentially within PDA-3 based on recommendations by the Operators during the Annual Planning Meeting. Delineation in PDA-3 with exception to seasonal wildlife restrictions would require approval of the BLM AO.

Phase 2 delineation would begin when Phase 1 delineation is complete or 18 months prior to when development begins in the southern end of DA-3 (Range 109 W.), whichever occurs sooner. Phase 2 delineation would precede development and would occur on a north-south line in the eastern-most portion of Range 109 W. It would extend from the south boundary of DA-3 to the north boundary of DA-3 generally occurring within a 1.5-mile area (east-west) at any time proceeding toward the west boundary of DA-3. Year-round development within the PDA would only occur if recommended during the Annual Planning Meeting and approved by the BLM AO.

Notwithstanding the above descriptions of Phase 1 and Phase 2 delineation in DA-3, it is the intent that activities under Phase 1 and Phase 2 would not overlap or be conducted at the same time. If the activities under Phase 1 delineation cease prior to completion of Phase 1 delineation, and Phase 2 delineation begins, the activities under Phase 1 would be allowed to resume once Phase 2 delineation is complete.

Development Area 4

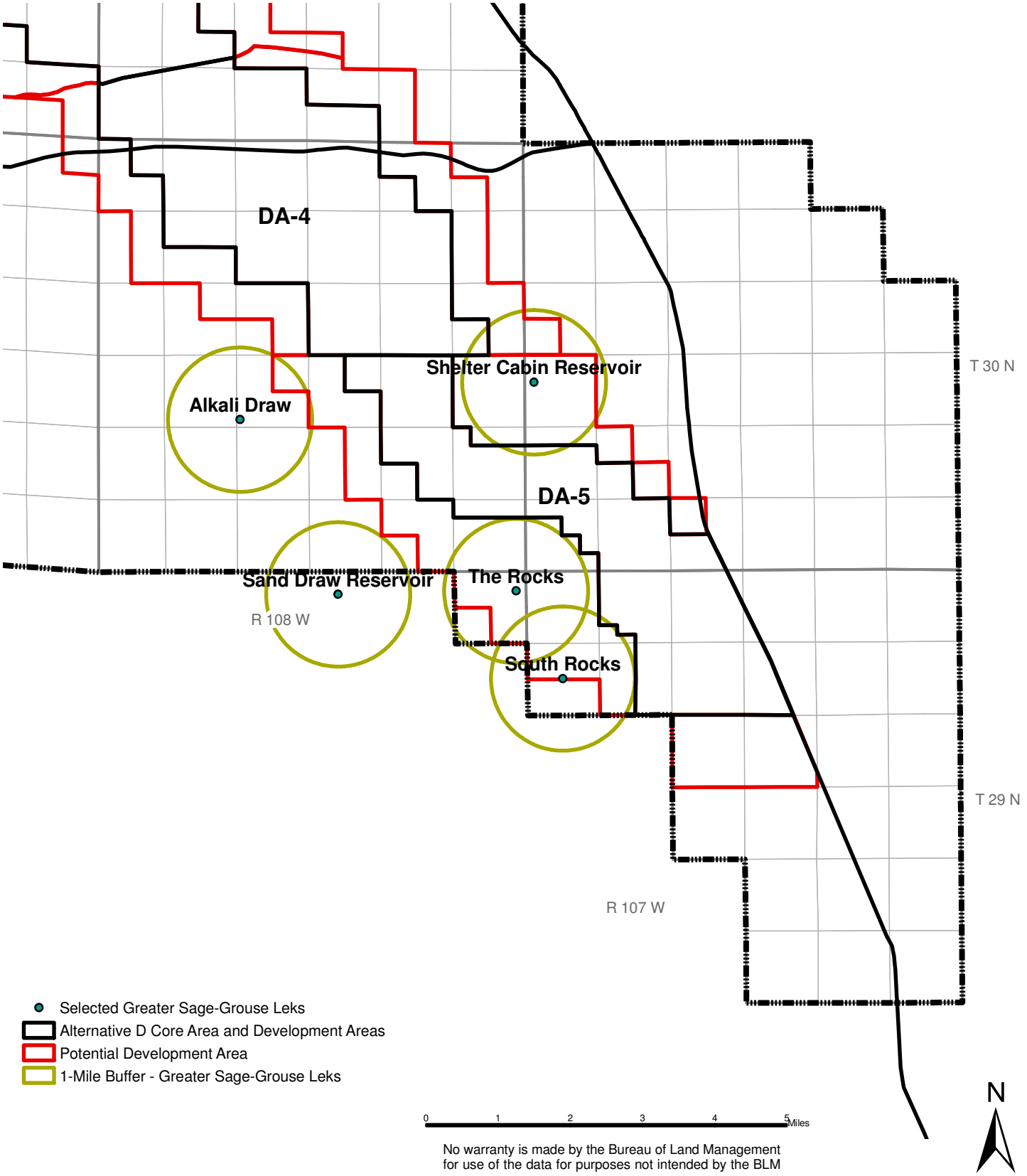
Development in DA-4. DA-4 includes 7,964 acres and has the potential for expansion within PDA-4 (4,532 acres). DA-4 is located in the southern portion of the PAPA and coincides with a portion of big game crucial winter range and is within 2 miles of several greater sage-grouse leks. Year-round development would be allowed within all areas of DA-4 with exception to seasonal restrictions for big game and greater sage-grouse seasonal habitats.

Delineation in DA-4. Year-round delineation would be allowed in all areas of DA-4 after issuance of the ROD. Delineation within PDA-4 would occur within seasonal restrictions. Based upon delineation success, and with review during the Annual Planning Meeting, year-round development could occur in PDA-4 with approval of the BLM AO.

Development Area 5

Development in DA-5. DA-5 is the southern-most DA and all of it is within 2 miles of one or more greater sage-grouse leks in the Yellow Point Lek Complex. Under Alternative D, the Alternative C DA-5 has been narrowed and elongated to avoid having the Alternative D Core Area (where there would be year-round development) within 1 mile of the Shelter Cabin Reservoir, The Rocks, South Rocks, Alkali Draw, and Sand Draw Reservoir greater sage-grouse leks (see Map 2.4-8).

Map 2.4-8
Location of Selected Greater Sage-Grouse Leks in Relation to DA-5



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There would be exception to seasonal restrictions for greater sage-grouse seasonal habitats; however, development would not be allowed within a 0.25-mile buffer of occupied greater sage-grouse leks. This is a standard NSO buffer that would apply to all occupied leks. Within DA-5, no additional well pads would be allowed where one or more already exist in a quarter-quarter section and only one well pad in a quarter-quarter section would be allowed where none currently exist. Recommendations for exceptions to the well pad limits in a quarter-quarter section would be reviewed during the Annual Planning Meeting and would be subject to approval from the BLM AO.

PDA-5 surrounding DA-5 consists of 7,503 acres where seasonal restrictions related to greater sage-grouse seasonal habitats would apply. Recommendations for year-round development in PDA-5 would be reviewed during the Annual Planning Meeting and would be subject to approval from the BLM AO. If approval is granted by the BLM AO for year-round development either in all or part of PDA-5, year-round development would occur within 1 mile (excluding the 0.25-mile NSO buffer) of only one of five designated leks (Shelter Cabin, Rocks, South Rocks, Alkali Draw, and Sand Draw) at any one time while also maintaining the 0.25-mile NSO buffer (see Map 2.4-8).

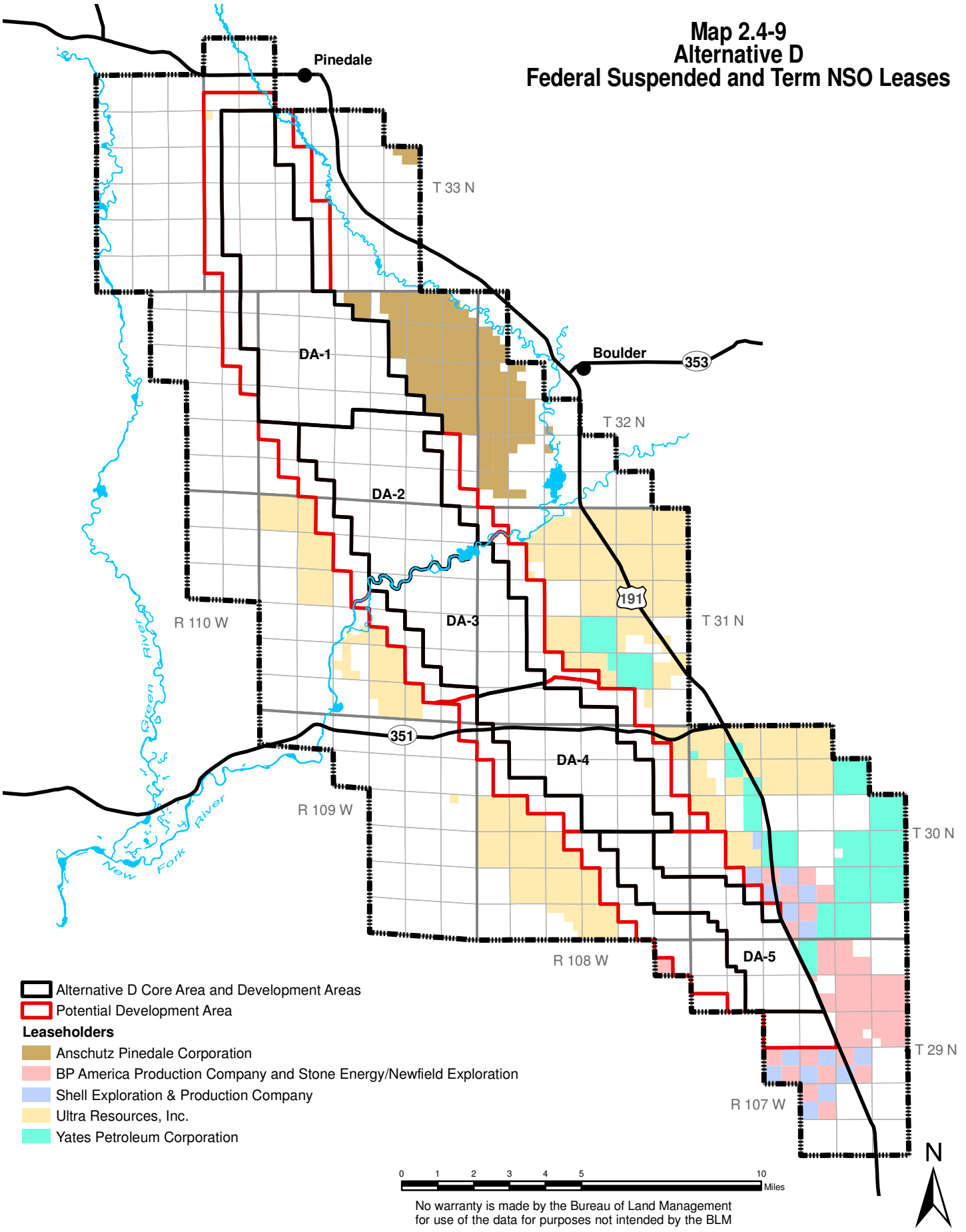
Shell and Ultra propose to construct the liquids gathering system in DA-5. Other Operators are not committing to installation of a liquids gathering system within their leases in DA-5.

Delineation in DA-5. Delineation would be allowed in all areas of DA-5 after issuance of the ROD with exception to seasonal restrictions in greater sage-grouse seasonal habitats. Delineation in PDA-5 would occur within seasonal restrictions for greater sage-grouse seasonal habitats; however, if delineation is successful, recommendations for year-round development in PDA-5 would be made during the Annual Planning Meeting and would require approved from the BLM AO.

2.4.3.4 Federal Suspended and Term NSO Leases

For Alternative D, Ultra, Shell, Anschutz, BP, Stone/Newfield, and Yates have offered to conduct no additional activity on certain leases in the Flanks (outside of the Alternative D Core Area and PDA) for at least 5 years. This would collectively include 49,903 acres inside the PAPA of which 16,954 acres are within big game crucial winter range and 37,019 acres are within 2-mile buffers of greater sage grouse leks (see Map 2.4-9). An additional 3,825 acres in the vicinity of the PAPA but outside of the PAPA boundary would also have no additional activity on certain leases. To accomplish this, leases without current production would be suspended. Leases that are producing cannot be suspended but would not have additional activity because of the Proponents' commitment to do no additional development in these term NSO leases for 5 years. After the primary term of 5 years, the need for federal suspended and term NSO leases would be reviewed during the Annual Planning Meeting. A determination on the status of the lease (whether to continue suspension or to resume the lease conditions) would be made by the BLM AO.

The owner with operating rights can request a lease suspension. If justified, the BLM can approve lease suspensions. BLM can direct lease suspensions in the interest of conservation. The BLM cannot impose NSO restrictions (if not already a lease stipulation) after the lease has been issued; however, the leaseholder can offer and agree to not use all or portions of the lease. Once offered by the leaseholder or Operator, and if selected in the ROD, the agreement would become binding. For the purpose of this analysis, it is assumed that all of the federal leases offered would be suspended and term NSO leases would be accepted.


Map 2.4-9
Alternative D
Federal Suspended and Term NSO Leases
Pinedale
Boulder
353
191
351
T 33 N
T 32 N
T 31 N
T 30 N
T 29 N
R 110 W
R 109 W
R 108 W
R 107 W
DA-1
DA-2
DA-3
DA-4
DA-5
Green River
New Fork River
Alternative D Core Area and Development Areas
Potential Development Area
Leaseholders
Anschutz Pinedale Corporation
BP America Production Company and Stone Energy/Newfield Exploration
Shell Exploration & Production Company
Ultra Resources, Inc.
Yates Petroleum Corporation
0 1 2 3 4 5 10 Miles
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2.4.3.5 Monitoring and Mitigation Fund

For Alternative D, Ultra, Shell, and Questar have voluntarily proposed the creation of the Pinedale Anticline Mitigation and Monitoring Fund to mitigate potential impacts identified in the Draft SEIS (BLM, 2006a). The fund would be in addition to the on-site mitigation the Proponents would implement under their proposal, including but not limited to:

- directional drilling,
- consolidated pad construction and development,
- consolidated completion activity,
- rig engine NO_x emissions controls,
- existing air monitoring agreements with WDEQ,
- liquids gathering system,
- current mule deer, pronghorn, and greater sage-grouse research, and
- current habitat and vegetation inventory.

The fund would be used for both on-site and off-site mitigation in compliance with BLM policy on off-site compensatory mitigation found in WO IM 2005-069 (BLM, 2005d). The fund could be used to support wildlife mitigation such as basic habitat enhancements for improvement of habitat function both on-site and off-site and to identify and protect key migration routes and wildlife habitat. The fund may also be used for monitoring impacts of the development and the effectiveness of the mitigation. Mitigation and monitoring could occur on federal, state, or private lands. Mitigation activities on federal land would undergo the appropriate level of environmental review prior to implementation.

2.4.4 Alternative E

Based upon public comments received on the Draft SEIS (BLM, 2006a), the BLM has developed Alternative E. Alternative E was created by the ID Team in response to comments concerning pace of development. Alternative E slows the pace of development by approximately 10 years with construction through 2015, drilling through 2033, and production through 2073.

Alternative E is similar to Alternatives B, C, and D with respect to the following and includes:

- all project components described for Components Common to All Alternatives, Alternative B, and Alternative C with the exception of the liquids gathering system;
- the Development Procedures for Wellfield Activities (Appendix 7) and Pipeline Design and Construction Procedures (Appendix 6);
- a total of 4,399 additional wells; and
- air quality impact analysis based on a peak of 48 drillings rigs operating in the PAPA.

Alternative E is unique with respect to the following and includes:

- development period through 2033;
- 415 additional well pads totaling 700 well pads for LOP since the PAPA ROD;
- additional initial disturbance of 10,427.0 acres and LOP disturbance of 4,185.6 acres;

- year-round development allowed by exception and existing decisions only (otherwise seasonal restrictions apply); and
- designation of management areas as developed in the PAPA DEIS and carried through into the PAPA ROD.

The Alternative E Core Area is the same as the Alternative D Core Area and under this Alternative is defined as the area containing the majority of the existing high intensity development. Year-round development would not be allowed in the Alternative E Core Area under Alternative E. The Alternative D PDA is included in Alternative E as the Buffer Area and areas outside of the Buffer Area are defined as the Flanks (Map 2.4-10). Certain limits on disturbance are defined for the Alternative E Core Area, Buffer Area, and for the Flanks, see Table 2.4-13 and Appendix 13. Alternative E does not contain provisions for federal suspended or term NSO leases in the Flanks outside of the Buffer Area. Alternative E is very similar to the No Action Alternative, but clearly allows for 700 producing well pads (since the PAPA ROD) and assumes that 4,399 wells would be drilled on the 700 well pads. The 700 well pad limit would apply to all lands in the PAPA, regardless of surface or mineral ownership. Once the 700 well pad limit is reached, additional well pads can be developed as well pads are reclaimed to full bond release status.

Management Areas and Limitations. Under Alternative E, the MAs established in the PAPA ROD (BLM, 2000b) would be carried forward. Adjustments to the MA boundaries have been made to account for the changes in leased/unleased federal minerals since 2000. MA 3 is designated as Unleased Federal Minerals. In 2000, when the PAPA ROD was issued, this MA included 1,347 acres (0.7 percent of the PAPA). Since 2000, many of the federal leases have expired and now MA 3 includes 37,067 acres or 18.7 percent of the PAPA. This adjustment to MA 3 causes an adjustment to the boundaries of the other MAs, thereby reducing their acreage. MA 8, Minimal Conflict Area, has been dissolved into the other MAs because it has been determined that no lands in the PAPA are truly “minimal conflict” and all lands have management concerns for a number of resources.

The PAPA ROD provided for an “average” number of well pads/square mile within MAs. Under Alternative E, this provision is replaced with a maximum number of active well pads per section. Well pad limits within MAs were provided for in the PAPA ROD but have been replaced in Alternative E with limitations on locations with production activity, active drilling, and unreclaimed disturbance. Restrictions and limitations have been developed for Alternative E. Generally, the most active well pads and surface disturbance would be allowed in the Alternative E Core Area, fewer would be allowed in the Buffer Area, and even fewer would be allowed in the Flanks. The Summary Management Prescriptions for each MA under Alternative E are provided in Table 2.4-13. The full requirements of Alternative E are included in Appendix 13.

Project Components. The project components under Alternative E include well pads, roads, gas gathering and limited liquids gathering pipelines. Transportation corridors, gas sales pipelines, trunk pipelines, and some of the ancillary facilities are also included in Alternative E. These components are required for continued transport of natural gas and liquids from the PAPA as development carries forward under the PAPA ROD (BLM, 2000b) or under any Alternative, and are detailed in Section 2.4.2.1 – Components Common to All Alternatives. Projected disturbance was determined from responses provided by the Proponents regarding how they would continue to develop natural gas resources under the PAPA ROD and subsequent Decision Records (BLM, 2004a, 2005a, 2005b, 2005c, and 2006b) assuming that seasonal restrictions for big game and greater sage-grouse in seasonal habitats would apply.

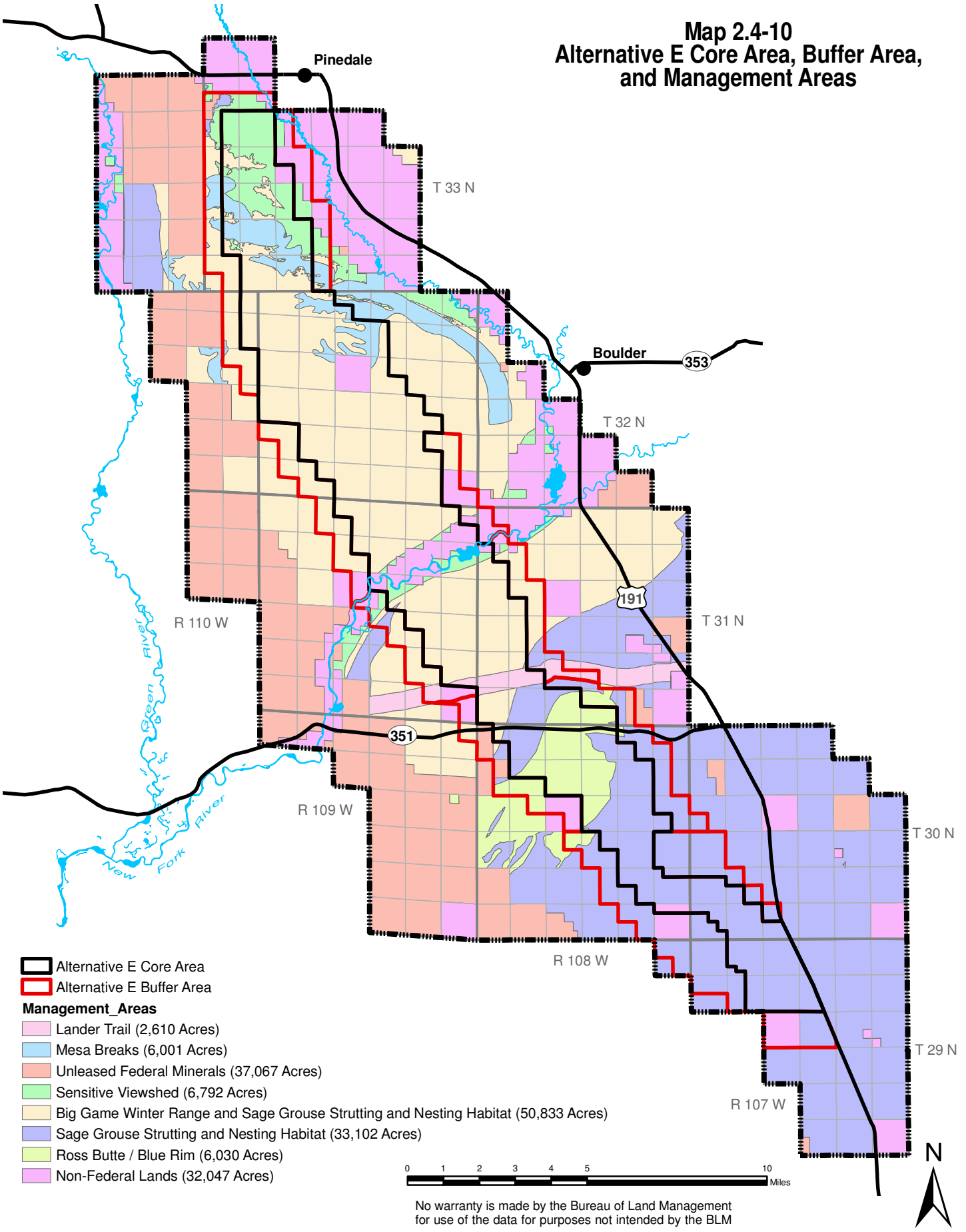
Map 2.4-10
Alternative E Core Area, Buffer Area, and Management Areas
Pinedale
Boulder
353
191
351
T 33 N
T 32 N
T 31 N
T 30 N
T 29 N
R 110 W
R 109 W
R 108 W
R 107 W
Green River
New Fork River
Alternative E Core Area
Alternative E Buffer Area
Management_Areas
Lander Trail (2,610 Acres)
Mesa Breaks (6,001 Acres)
Unleased Federal Minerals (37,067 Acres)
Sensitive Viewshed (6,792 Acres)
Big Game Winter Range and Sage Grouse Strutting and Nesting Habitat (50,833 Acres)
Sage Grouse Strutting and Nesting Habitat (33,102 Acres)
Ross Butte / Blue Rim (6,030 Acres)
Non-Federal Lands (32,047 Acres)
0 1 2 3 4 5 10 Miles
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Table 2.4-13
Summary Management Prescriptions under Alternative E

Management Area	Summary Management Prescription		
	Alternative E Core Area	**Buffer Area**	**Flanks**
MA-1 Lander Trail	No surface occupancy within 0.25-mile buffer of the Lander Trail	No surface occupancy within 0.25-mile buffer of the Lander Trail	No surface occupancy within 0.25-mile buffer of the Lander Trail
MA-2 Mesa Breaks	No more than four active well pads and 80 acres of surface disturbance per section No more than two CPFs per Operator per section	No more than two active well pads and 60 acres of surface disturbance per section No permanent facilities - would be moved to the Alternative E Core Area	No more than two active well pads and 40 acres of surface disturbance per section No more than two CPFs per Operator per section
MA-3 Unleased Federal Minerals	Any lease parcels that expire during preparation of the RMP would be considered for inclusion in this MA	Any lease parcels that expire during preparation of the RMP would be included in this MA	Any lease parcels that expire during preparation of the RMP would be included in this MA
MA-4 Sensitive Viewshed	No more than four active well pads and 80 acres of surface disturbance per section No restriction on permanent facilities as long as surface disturbance limits are not exceeded	No more than four active well pads and 60 acres of surface disturbance per section No permanent facilities - would be moved to the Alternative E Core Area	No more than four active well pads and 40 acres of surface disturbance per section No permanent facilities (90 days or more) that cannot be adequately mitigated for the protection of visual resources would be authorized
MA 5 Big Game Winter Range and Sage-Grouse Strutting and Nesting Habitat	No more than eight active well pads and 80 acres of surface disturbance per section No more than two CPFs per Operator per section	No more than two active well pads and 60 acres of surface disturbance per section No permanent facilities - would be moved to the Alternative E Core Area	No more than two active well pads and 40 acres of surface disturbance per section No more than two CPFs per Operator per section
MA 6 Sage Grouse Strutting and Nesting Habitat	No more than eight active well pads and 80 acres of surface disturbance per section No more than one CPF per Operator per section Within VRM Class III – no more than four active well pads per section	No more than one active well pad and 40 acres of surface disturbance per section No permanent facilities - would be moved to the Alternative E Core Area Same as core	No more than one active well pad and 40 acres of surface disturbance per section No more than one CPF per Operator per section Same as core
MA 7 Ross Butte/Blue Rim	No more than four active well pads and 80 acres of surface disturbance per section Permanent facilities allowed as long as surface disturbance limits are not exceeded	No more than one active well pad and 40 acres of surface disturbance per section No permanent facilities - would be moved to the Alternative E Core Area	No more than one active well pad and 40 acres of surface disturbance per section No more than one CPF per Operator per section

Management Area	Summary Management Prescription		
	Alternative E Core Area	Buffer	Flanks
MA 8 Minimal Conflict Area	Areas of Minimal Conflict have been dissolved into MA 5, MA 6, and MA 7. MA 8 no longer exists, but is provided for continuity between the PAPA ROD (2000) and this analysis.		
MA 9 Non-Federal Lands (Private and state lands not under the jurisdiction of the BLM)	To compensate for impacts resulting from development on private and state lands, well pads in this MA would count against the 700 total well pad limit. BLM cannot impose management objectives or restrictions/limitations on these lands. The COE regulates the discharge of dredged or fill materials into waters of the United States and would require Operators to demonstrate that impacts to special aquatic sites, including wetlands, have been avoided and minimized to the maximum extent practicable. The USFWS administers migratory bird species, threatened and endangered species, and species that are proposed for listing. Operators are required to comply with the Endangered Species Act, Bald and Golden Eagle Protection Act, and Migratory Bird Treaty Act, regardless of land ownership, in the implementation of construction, drilling, and operation of natural gas development.		

The proposed project components and estimated disturbance for Alternative E are provided in Table 2.4-14. Initial disturbance is defined as the amount of acreage that is disturbed at the time of construction. Alternative E initial disturbance for well pads, roads, and gathering pipelines is estimated to be 10,427.0 acres. LOP disturbance for the same components is expected to be 4,185.6 acres. LOP disturbance is defined as the amount of disturbance remaining once reclamation has occurred. For example, it is assumed that 60 percent of initial surface disturbance associated with well pads would be reclaimed when all development activities have been completed. Likewise, it is assumed that 20 percent of the initial disturbance for roads would be reclaimed while 80 percent of the disturbance would remain to support continued operations.

Nearly all initial disturbance for pipelines would be reclaimed, leaving almost no LOP disturbance. In contrast, for other ancillary facilities such as compressor station expansion, central gathering facilities, etc., the LOP disturbance would be the same as the initial disturbance, i.e., none of the disturbance would be reclaimed until the facility is no longer in use.

Wells and Drilling Rigs. An estimate of the number of wells drilled, new well pads, and drilling rigs under Alternative E by year is provided in Table 2.4-15. More drilling rigs would be operating in the summer than in the winter under Alternative E because seasonal restrictions for big game and greater sage-grouse in seasonal habitats would apply.

Table 2.4-14
Estimated Initial and Life-of-Project Disturbance under Alternative E

Component	Number or Miles	Initial Disturbance (acres)	Life-of-Project Disturbance (acres)
Well Pads, Roads and Gas Gathering Pipelines			
Well Pads[1]	415 pads	8,113.0	3,245.2
Local and Resource Roads[2]	166 miles	1,006.1	804.9
Gas Gathering Pipelines[3]	166 miles	503.0	0.0
Liquids Gathering Pipelines[4]	31.5 miles	190.9	0.0
Subtotal		**9,813.0**	**4,050.1**
Trunk Pipelines and Ancillary Facilities			
30- to 42-inch Mesa Loop Lines[5]	15.3 miles	370.9	1.0
8-inch water line[6]	18.0 miles	109.1	0.5
Compressor Sites (expansion)	3 sites	110.0	110
Central Gathering Facilities	6 sites	12.0	12.0

Component	Number or Miles	Initial Disturbance (acres)	Life-of-Project Disturbance (acres)
Water Trucking Facility	1 site	7.0	7.0
Expand Stabilizer Site	1 site	5.0	5.0
Subtotal		**614.0**	**135.5**
Total Wellfield Components		**10,427.0**	**4,185.6**

[1] Disturbance includes new well pads and expansion of existing well pads. LOP disturbance assumes 60 percent reclamation of well pads.
[2] Assumes no new collector roads would be built within the PAPA, estimate for miles of proposed roads is based on factors determined from existing roads. LOP disturbance assumes 20 percent reclamation of roads.
[3] Estimate for miles of proposed gas gathering pipelines is based on factors determined from existing roads.
[4] Estimate for miles of proposed liquids gathering pipelines is based on data provided by the Proponents.
[5] Disturbance is based on 200-foot construction right-of-way width. Includes two co-located 30- to 42-inch gas pipelines from Stewart Point to Pinedale/Gobblers Knob Compressor Station. Includes 30.6 miles of pipeline but because they are co-located, 200-foot construction right-of-way is 15.3 miles. The two pipelines will be built at separate times.
[6] Disturbance is based on 50-foot construction right-of-way width from Stewart Point area to Highway 351.

Table 2.4-15
Estimated Wells, New Well Pads, and Drilling Rigs by Year under Alternative E

Year	Wells	New Well Pads	Drilling Rigs	
			Summer	Winter
2007	231	92	43	30
2008	235	53	43	30
2009	236	54	43	30
2010	217	27	40	27
2011	220	48	40	27
2012	185	44	36	23
2013	191	45	36	23
2014	188	41	36	23
2015	188	11	36	23
2016	187	0	36	23
2017	186	0	36	23
2018	186	0	36	23
2019	185	0	36	20
2020	178	0	32	20
2021	175	0	32	20
2022	175	0	32	20
2023	175	0	32	20
2024	175	0	32	20
2025	137	0	27	15
2026	130	0	26	14
2027	130	0	26	14
2028	130	0	26	14
2029	102	0	26	14
2030	101	0	26	14
2031	70	0	22	14
2032	70	0	16	8
2033	16	0	2	2
Total	**4,399**	**415**		

Well Pads. The Proponents provided information on the number and locations of wells pads within each MA if they were to continue development under the PAPA ROD (BLM, 2000b). This scenario was used to describe Alternative E for 4,399 wells. There are no limits to the number

of well pads within each individual MA under Alternative E, unlike management under the PAPA ROD. The limit of 700 producing well pads allowed under the PAPA ROD applies to all well pads constructed since July 2000. As of November 2006, there were 285 well pads constructed since the issuance of the PAPA ROD and therefore, there were 415 remaining well pads to reach the limit of 700 well pads.

Initial surface disturbance estimates are for 8,113.0 acres to construct 415 new well pads under Alternative E, with a LOP surface disturbance of 3,245.2 acres. Interim reclamation would be limited under Alternative E because well pads would be left open when seasonal wildlife restrictions go into effect. Operators would have to move rigs and return during the next season to the same pad. Reclamation would be similar to what is occurring now with management under the PAPA ROD.

Roads and Gathering Pipelines. Under Alternative E and similar to other Alternatives, it is assumed that there would be no additional construction of collector roads in the PAPA. There would be an estimated 166 miles of local and resource roads constructed in the PAPA for an initial disturbance of 1,006.1 acres and a LOP disturbance of 804.9 acres, assuming that 20 percent of the initial road disturbance is reclaimed after construction (see Table 2.4-14). It is estimated that there would be 166 miles of gas gathering pipelines and 31.5 miles of liquids gathering pipelines (continuation of existing liquids gathering system in leaseholds currently held by Questar), with an initial disturbance of 503.0 and 190.9 acres, respectively. There is no LOP disturbance associated with construction of gathering pipelines because the entire disturbance is reclaimed after construction.

Pad Drilling and Centralized Production Facilities. This Alternative considers pad drilling as an option for reducing surface disturbance and human presence in the PAPA and the use of centralized production facilities (CPFs) to minimize storage of condensate and produced water on each well pad, collecting them at central locations.

Year-Round Development. Under Alternative E, year-round development would not be allowed in big game (pronghorn and mule deer) and greater sage-grouse seasonal habitats except as allowed by BLM's 2004 Decision Record (BLM, 2004a). This allowed limited year-round development within Questar's leaseholds through winter 2013-2014. Approved components in the Decision Record are provided in Appendix 1.

2.4.4.1 Summary of Surface Disturbance for Alternatives Analyzed in Detail

A comparison of the Alternatives is provided in Table 2.4-16 showing estimates of initial and LOP disturbance for each of the Alternatives. Table 2.4-17 provides a comparison of the impacts across all Alternatives that were analyzed in detail. Detailed descriptions of the impacts are presented in Chapter 4, Environmental Consequences.

Table 2.4-16
Summary of Surface Disturbance for Alternatives Analyzed in Detail

	Alternative A (acres)	Alternatives B, C and D (acres)	Alternative E (acres)
Well Pads, Roads, and Gas Gathering Pipelines			
Initial Surface Disturbance	3,465.5	9,022.0	9,622.1
Life-of-Project Disturbance	1,507.0	3,730.0	4,050.1
Components Associated with Liquids Gathering System			
Initial Surface Disturbance	196.70	3,382.7	324.0
Life-of-Project Disturbance	24.5	171.5	24.5
Other Components			
Initial Surface Disturbance	460.9	480.9	480.9
Life-of-Project Disturbance	91.0	111.0	111.0

	Alternative A (acres)	Alternatives B, C and D (acres)	Alternative E (acres)
All Wellfield Components – Combined			
Initial Surface Disturbance	4,123.1	12,885.6	10,427.0
Life-of-Project Disturbance	1,622.5	4,012.5	4,185.6

2.4.5 Alternatives Considered but not Analyzed in Detail

Elements of Alternatives identified as not analyzed in detail in the Draft SEIS (BLM, 2006a) are included in Alternatives analyzed in detail in this Revised Draft SEIS.

Conservation Alternative. The Conservation Alternative would be similar to the No Action Alternative but would require additional mitigation. All seasonal restrictions for big game and greater sage-grouse seasonal habitats would apply and there would be no exceptions allowed. All Operators would be required to use liquids gathering systems for transport of condensate and produced water to central gathering facilities. No new pads would be allowed in a quarter-section (approximately 160 acres) if there are one or more existing pads. Operators would be required to expand existing pads unless there are topographical constraints. Operators would be required to drill out a quarter-section before moving to another area and would not be allowed to return. No more than four active well pads per section would be allowed. Operators would be required to have Tier 2 equivalent emission controls on all drilling rigs in the PAPA, and all completions would be required to be "green" (recover most of the production rather than flaring it all). This Alternative was not analyzed in detail for the following reasons:

- The use of Tier 2 equivalent emission controls on drilling rigs requires that existing drilling rigs either be retrofitted or that new drilling rig engines be built with these emission controls. With all seasonal restrictions in effect, Operators are not able to keep drilling rigs through the winter and there is no guarantee that they could get the same drilling rigs (with the emission controls) back to the PAPA for the spring/summer/fall drilling. This is especially true currently, because drilling rigs are difficult to obtain.
- Although in most cases Operators would be able to develop the resource on four well pads per section (one well pad per quarter section); in some locations it would not be possible due to topographical or resource constraints. In these locations, more well pads could be required to avoid steep slopes, sensitive soils, greater sage-grouse leks, bald eagle nests, etc. A limitation on well pads per section has been analyzed as part of Alternative E.
- Most completion operations in the PAPA are green as specified in the Operators' WDEQ permits. Due to safety issues or location (insufficient production pressure), it is not feasible to use green completions all the time. This practice is used, where feasible, and is included in the analysis of Alternatives.

2.4.5.1 Maximum Development Alternative

A Maximum Development Alternative was considered but not analyzed in detail. This Alternative would include development of natural gas resources by wells with 5-acre bottom-hole spacing from the Lance Formation and development of the deeper Rock Spring Formation natural gas resource as yet undefined, on 160-acre bottom-hole spacing. This development level would be allowed year-round within a core area flanking the Anticline Crest (where there is maximum potential for development) and would extend to an additional 0.5 mile distance from the core area. If the development would expand beyond the core area and reach a density of

Table 2.4-17
Comparison of Impacts for all Alternatives

Resource	No Action Alternative	Alternative B	Alternative C	Alternative D	Alternative E
Environmental Justice					
Susceptible Populations	No impact to minority populations, low income populations, or Indian Tribes	No impact - similar to No Action	No impact - similar to No Action	No impact - similar to No Action	No impact - similar to No Action
Socioeconomic Resources					
Workforce	The number of development workers would peak in 2009 at 1,060, and fall to 0 in 2012. The number of production workers would peak in 2011 at 210, and remain through 2051	The number of development workers would peak in 2009 at 1,370, and fall to 0 in 2026. The number of production workers would peak in 2025 at 381, and remain through 2065	Impact similar to Alternative B	Impact similar to Alternative B	The number of development workers would peak in 2009 at 1,060, same as No Action, and fall to 0 in 2034. The number of production workers would peak in 2033 at 601, and remain through 2073
Housing	There is pressure on a tight housing market. A sharp decline in development workers may adversely affect the housing market in 2012	There is a greater up-front demand for housing for development workers, and it is expected that the market would continue to expand. The production workforce would remain steady for 40 years, providing stabilization	Impact similar to Alternative B	Impact similar to Alternative B	There may be a larger demand for housing for production workers than in the other the other Alternatives, although this workforce would remain steady for 40 years, providing stabilization
Population	Population estimate for Sublette, Sweetwater, and Lincoln counties in 2011 is 69,380 and in 2020 is 77,380, with the greatest increase in Sublette County	Low impact population estimate for Sublette, Sweetwater, and Lincoln counties in 2011 is 69,510, and in 2020 is 78,169 with the greatest increase in Sublette County	Impact similar to Alternative B	Impact similar to Alternative B	Low impact population estimate for Sublette, Sweetwater, and Lincoln counties in 2011 is the same as No Action and in 2020, it is 78,257, with the greatest increase in Sublette County
		Medium impact population estimate for Sublette, Sweetwater, and Lincoln counties in 2011 is 69,615, and in 2020 is 77,448 with the greatest increase in Sublette County			Medium impact population estimate for Sublette, Sweetwater, and Lincoln counties in 2011 is 69,380 and in 2020, it is 78,523
		High impact population estimate for Sublette, Sweetwater, and Lincoln counties in 2011 is 69,717 in 2011, and 77,721 in 2020			High impact population estimate for Sublette, Sweetwater, and Lincoln counties is 69,380 in 2011 and in 2020, it is 78,783
Local Demands	Local infrastructure, services, and facilities demand continues in similar manner, with need lessening greatly in 2012	Increased immediate need for local infrastructure, services, and facilities because of development workers, with a steady production workforce for 40 years	Impact similar to Alternative B	Impact similar to Alternative B	Local infrastructure, services, and facilities demand continues in similar manner, with demand gradually decreasing for both development and production workers
Economic Benefit	Direct, indirect, and induced economic benefits from drilling total $2,430,179 per well	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative
	Earnings from development are estimated to peak in 2009, at $573,522,150	Earnings from development are estimated to peak in 2009, at $741,204,473	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action Alternative
	Earnings from production are estimated to peak in 2011 at $110,292,283	Earnings from production are estimated to peak in 2017, at $162,628,449	Impact similar to Alternative B	Impact similar to Alternative B	Earnings from production are estimated to peak in 2013, at $109,505,086
Mineral Royalties	The average total federal mineral royalty from the PAPA, 2007-2051, is $79,048,715, based on 2006 rates	The average total federal mineral royalty from the PAPA, 2007-2065, is $232,854,993, based on 2006 rates	Impact similar to Alternative B	Impact similar to Alternative B	The average total federal mineral royalty from the PAPA, 2007-2073, is $205,051,412, based on 2006 rates
Ad Valorem Tax	The average ad valorem production from the PAPA, 2007-2051, is $40,537,803, based on 2006 rates	The average ad valorem production from the PAPA, 2007-2065, is $119,412,817, based on 2006 rates	Impact similar to Alternative B	Impact similar to Alternative B	The average ad valorem production from the PAPA,, 2007-2073, is $105,154,570, based on 2006 rates
Transportation					
Road Construction	More vehicles in the PAPA due to increased construction of 99.6 miles of new road	More vehicles in the PAPA due to increased construction of 100 miles of new road	Impact similar to Alternative B	Impact similar to Alternative B	More vehicles in the PAPA due to increased construction of 166 miles of new road
Traffic	Increased development- and production-related traffic due to increased development with limited liquids gathering system and use of computer-assisted operations	Increased development-related traffic due to increased development. Reduction in production-related traffic of 3,820 vehicles per day in production phase due to installation and use of liquids gathering system and computer-assisted operations	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action Alternative
Road Maintenance	Increased arterial road maintenance cost to WDOT due to increased traffic volume	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative
Vehicular Crashes	Increased vehicular crash rates due to increased traffic volume	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative

Resource	No Action Alternative	Alternative B	Alternative C	Alternative D	Alternative E
Land Use and Residential Areas					
Existing Land Use Categories	Change of existing land use categories to a predominant industrial landscape by 4,123.1 acres of initial surface disturbance and 1,622.5 acres of life-of-project surface disturbance	Impact similar to No Action but increased to 12,885.6 acres of initial surface disturbance and increased to 4,012.5 acres of life-of-project surface disturbance	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased to 10,427.0 acres of initial surface disturbance and increased to 4,185.6 acres of life-of-project surface disturbance
Sublette County Resource Conservation Zoning District	New initial surface disturbance of 147.7 acres on non-federal land in conflict with Sublette County Resource Conservation Zoning District	New initial surface disturbance of 710.0 acres on non-federal land in conflict with Sublette County Resource Conservation Zoning District	Impact similar to Alternative B	Impact similar to Alternative B	New initial surface disturbance of 371.1 acres on non-federal land in conflict with Sublette County Resource Conservation Zoning District
Residential SRMZ and 0.25-Mile Residential Buffer	No new wellfield development conflicting with any Sublette County residential zoning districts but 82.6 acres of initial disturbance in the 0.25-mile residential buffer and 91.7 acres of initial disturbance in the Residential SRMZ	No new wellfield development conflicting with any Sublette County residential zoning districts but 71.9 acres of initial disturbance in the 0.25-mile residential buffer and 114.9 acres of initial disturbance in the Residential SRMZ	Impact similar to Alternative B	Impact similar to Alternative B	No new wellfield development conflicting with any Sublette County residential zoning districts but 212.6 acres of initial disturbance in the 0.25-mile residential buffer and 235.5 acres of initial disturbance in the Residential SRMZ
Recreation Resources					
	Decreased recreational use of three OHV areas in the PAPA by 3,636.5 acres of initial surface disturbance	Decreased recreational use of three OHV areas in the PAPA by 11,185.4 acres of initial surface disturbance	Impact similar to Alternative B	Impact similar to Alternative B	Decreased recreational use of three OHV areas in the PAPA by 9,247.0 acres of initial surface disturbance
	Decreased hunting opportunities in the PAPA with decreased abundance of big game and upland game birds from increased density of wellfield development and 4,123.1 acres of initial surface disturbance and 1,622.5 acres of life-of-project surface disturbance	Impact similar to No Action but increased by 12,885.6 acres of initial surface disturbance and increased to 4,012.5 acres of life-of-project surface disturbance	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased by 10,427.0 acres of initial surface disturbance and increased to 4,185.6 acres of life-of-project surface disturbance
Visual Resources					
Visual Resource Management Classes	Wellfield development becomes a locally dominant feature in VRM II class with 111.0 acres of new surface disturbance on federal land	Impact similar to No Action but increased to 495.5 acres of new surface disturbance in VRM II class	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased to 240.8 acres of new surface disturbance in VRM II class
	Wellfield development becomes a locally dominant feature in VRM III class with 848.7 acres of new surface disturbance on federal land	Impact similar to No Action but increased to 2,189.7 acres of new surface disturbance in VRM III class on federal land	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased to 1,947.1 acres of new surface disturbance in VRM III class on federal land
Sensitive Viewshed SRMZ	Local industrialized appearance in the Sensitive Viewshed SRMZ with 253.6 acres of new surface disturbance on federal land	Impact similar to No Action but increased by 1,540.2 acres of new surface disturbance in the Sensitive Viewshed SRMZ on federal land	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased to 410.2 acres of new surface disturbance in the Sensitive Viewshed SRMZ on federal land
Condensate and Water Storage Tanks	All producing locations would continue to have high profile condensate and water storage tanks	Approximately 90 percent of all condensate and water storage tanks would be reduced due to liquids gathering system	Impact similar to Alternative B	Impact similar to Alternative B	All producing locations would continue to have high profile condensate and water storage tanks
Cultural Resources					
Unexpected Discoveries	Destruction and/or unexpected discoveries of archaeological resources by 4,123.1 acres of new surface disturbance in the PAPA	Impact similar to No Action but increased to 12,885.6 acres of new surface disturbance	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased to 10,427.0 acres of new surface disturbance
	Increased disturbance to areas with high potential for major finds (sandy bluffs south of the New Fork River, not in Mesa Breaks)	Increased disturbance to areas with high potential for major finds (sandy bluffs south of New Fork River and Mesa Breaks)	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action Alternative
	No new surface disturbance in frozen soils and with limited or no destruction of archaeological resources	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative
Lander Trail	No disturbance in the 0.25-mile buffer of the Lander Trail	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative
	Decreased visual integrity within the Lander Trail SRMZ by 458.0 acres of surface disturbance on federal lands	Impact similar to No Action but increased by potential surface disturbance (1,307.9 acres on federal land) within the Lander Trail SRMZ	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased by potential surface disturbance (1,383.3 acres on federal land) within the Lander Trail SRMZ

Resource	No Action Alternative	Alternative B	Alternative C	Alternative D	Alternative E
Air Quality					
Concentrations of Criteria Pollutants CO, NO_2, SO_2, O_3, PM_{10},and $PM_{2.5}$ Within and Nearby the Project Area	Predicted concentrations are in compliance with applicable NAAQS and WAAQS; predicted concentrations are above the applicable Class II PSD 24-hour PM_{10} increment[1], and the annual NO_2 increment; and below the PSD annual PM_{10} increment and increments for SO_2	Predicted concentrations are in compliance with applicable NAAQS and WAAQS at all locations; predicted concentrations of NO_2 are above the applicable Class II PSD annual NO_2 increment[1], and below the PSD increments for SO_2 and PM_{10}	Phase I Mitigation: Predicted concentrations are in compliance with applicable NAAQS and WAAQS at all locations; predicted concentrations of NO_2 are above the applicable Class II PSD annual NO_2 increment[1], and below the PSD increments for SO_2 and PM_{10} Phase II Mitigation: Predicted concentrations are in compliance with applicable NAAQS and WAAQS at all locations; predicted concentrations are below the applicable PSD increments[1] for NO_2, SO_2 and PM_{10}	Phase I Mitigation: Predicted concentrations are in compliance with applicable NAAQS and WAAQS at all locations; predicted concentrations of NO_2 are above the applicable Class II PSD annual NO_2 increment[1], and below the PSD increments for SO_2 and PM_{10} Phase II Mitigation: Predicted concentrations are in compliance with applicable NAAQS and WAAQS at all locations; predicted concentrations are below the applicable PSD increments for NO_2, SO_2 and PM_{10}	Predicted concentrations are in compliance with applicable NAAQS and WAAQS; predicted concentrations are above the applicable Class II PSD 24-hour PM_{10} increment[1], and the annual NO_2 increment; and below the PSD annual PM_{10} increment and increments for SO_2
Concentrations of Criteria Pollutants NO_2, SO_2, O_3, PM_{10},and $PM_{2.5}$ at PSD Class I and Sensitive PSD Class II Areas	Predicted concentrations are in compliance with applicable NAAQS and WAAQS at all locations; predicted concentrations are below PSD increments	Predicted concentrations are in compliance with applicable NAAQS and WAAQS at all locations; predicted concentrations are below PSD increments	Phase I Mitigation: Predicted concentrations are in compliance with applicable NAAQS and WAAQS at all locations; predicted concentrations are below PSD increments[1] Phase II Mitigation: Predicted concentrations are in compliance with applicable NAAQS and WAAQS at all locations; predicted concentrations are below PSD increments	Phase I Mitigation: Predicted concentrations are in compliance with applicable NAAQS and WAAQS at all locations; predicted concentrations are below PSD increments[1] Phase II Mitigation: Predicted concentrations are in compliance with applicable NAAQS and WAAQS at all locations; predicted concentrations are below PSD increments	Predicted concentrations are in compliance with applicable NAAQS and WAAQS at all locations; predicted concentrations are below PSD increments
Visibility (Regional Haze) Impacts at PSD Class I and Sensitive PSD Class II areas	Predicted visibility impacts are greater than the 1.0 dv threshold for a maximum of 62 days per year at the Bridger Wilderness, 8 days at the Fitzpatrick Wilderness, 2 days at Grand Teton National Park, 6 days at the Gros Ventre Wilderness, 12 days at the Popo Agie Wilderness, 1 day at the Teton Wilderness, 2 days at the Washakie Wilderness, 9 days at the Wind River Roadless Area, and below 1.0 dv at all other sensitive areas	Predicted visibility impacts are greater than the 1.0 dv threshold for a maximum of 67 days per year at the Bridger Wilderness, 10 days at the Fitzpatrick Wilderness, 3 days at Grand Teton National Park, 8 days at the Gros Ventre Wilderness, 14 days at the Popo Agie Wilderness, 1 day at the Teton Wilderness, 2 days at the Washakie Wilderness, 10 days at the Wind River Roadless Area, and below 1.0 dv at all other sensitive areas	Phase I Mitigation: Predicted visibility impacts are greater than the 1.0 dv threshold for a maximum of 40 days per year at the Bridger Wilderness, 5 days at the Fitzpatrick Wilderness, 1 day at Grand Teton National Park, 2 days at the Gros Ventre Wilderness, 6 days at the Popo Agie Wilderness, 5 days at the Wind River Roadless Area, and below 1.0 dv at all other sensitive areas Predicted visibility impacts are less than year-2005 project impacts Phase II Mitigation: Predicted visibility impacts are greater than the 1.0 dv threshold for a maximum of 10 days per year at the Bridger Wilderness, 1 day at the Fitzpatrick Wilderness, 1 day at the Gros Ventre Wilderness, 1 day at the Wind River Roadless Area, and below 1.0 dv at all other sensitive areas Predicted visibility impacts are less than year-2005 project impacts	Phase I Mitigation: Predicted visibility impacts are greater than the 1.0 dv threshold for a maximum of 40 days per year at the Bridger Wilderness, 5 days at the Fitzpatrick Wilderness, 1 day at Grand Teton National Park, 2 days at the Gros Ventre Wilderness, 6 days at the Popo Agie Wilderness, 5 days at the Wind River Roadless Area, and below 1.0 dv at all other sensitive areas Predicted visibility impacts are less than year-2005 project impacts Phase II Mitigation: Predicted visibility impacts are less than the 1.0 dv threshold at all sensitive areas Predicted visibility impacts are less than year-2005 project impacts	Predicted visibility impacts are greater than the 1.0 dv threshold for a maximum of 62 days per year at the Bridger Wilderness, 8 days at the Fitzpatrick Wilderness, 2 days at Grand Teton National Park, 6 days at the Gros Ventre Wilderness, 12 days at the Popo Agie Wilderness, 1 day at the Teton Wilderness, 2 days at the Washakie Wilderness, 9 days at the Wind River Roadless Area, and below 1.0 dv at all other sensitive areas
Visibility (Regional Haze) Impacts at Regional Communities	Predicted visibility impacts are greater than the 1.0 dv threshold for a maximum of 126 days per year at Boulder, 89 days at Pinedale, and 58 days at Cora	Predicted visibility impacts are greater than the 1.0 dv threshold for a maximum of 138 days per year at Boulder, 91 days at Pinedale, and 62 days at Cora	Phase I Mitigation: Predicted visibility impacts are greater than the 1.0 dv threshold for a maximum of 107 days per year at Boulder, 70 days at Pinedale, and 47 days at Cora Predicted visibility impacts are less than year-2005 project impacts Phase II Mitigation: Predicted visibility impacts are greater than the 1.0 dv threshold for a maximum of 45 days per year at Boulder, 25 days at Pinedale, and 12 days at Cora Predicted visibility impacts are less than year-2005 project impacts	Phase I Mitigation: Predicted visibility impacts are greater than the 1.0 dv threshold for a maximum of 107 days per year at Boulder, 70 days at Pinedale, and 47 days at Cora Predicted visibility impacts are less than year-2005 project impacts Phase II Mitigation: Predicted visibility impacts are less than Phase I Mitigation impacts Predicted visibility impacts are less than year-2005 project impacts	Predicted visibility impacts are greater than the 1.0 dv threshold for a maximum of 126 days per year at Boulder, 89 days at Pinedale, and 58 days at Cora

Resource	No Action Alternative	Alternative B	Alternative C	Alternative D	Alternative E
Atmospheric/terrestrial Deposition	Predicted impacts from sulfur and nitrogen deposition are less than the total deposition LOC at all analyzed areas	Predicted impacts from sulfur and nitrogen deposition are less than the total deposition LOC at all analyzed areas	Phase I Mitigation: Predicted impacts from sulfur and nitrogen deposition are less than the total deposition LOC at all analyzed areas Phase II Mitigation: Predicted impacts from sulfur and nitrogen deposition are less than the total deposition LOC at all analyzed areas	Phase I Mitigation: Predicted impacts from sulfur and nitrogen deposition are less than the total deposition LOC at all analyzed areas Phase II Mitigation: Predicted impacts from sulfur and nitrogen deposition are less than the total deposition LOC at all analyzed areas	Predicted impacts from sulfur and nitrogen deposition are less than the total deposition LOC at all analyzed areas
Sensitive Lake ANC	Predicted impacts resulted in less than the LAC at all acid-sensitive lakes	Predicted impacts resulted in less than the LAC at all acid-sensitive lakes	Phase I Mitigation: Predicted impacts resulted in less than the LAC at all acid sensitive lakes Phase II Mitigation: Predicted impacts resulted in less than the LAC at all acid-sensitive lakes	Phase I Mitigation: Predicted impacts resulted in less than the LAC at all acid sensitive lakes Phase II Mitigation: Predicted impacts resulted in less than the LAC at all acid-sensitive lakes	Predicted impacts resulted in less than the LAC at all acid-sensitive lakes
Noise					
Noise-Sensitive Sites	Drilling and completion at some of the 1,139 new wells would increase noise above 10 dBA at noise-sensitive sites (residences, greater sage-grouse leks).up to 2,800 feet away	Impact similar to No Action by some of the 4,399 new wells drilled and completed	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to Alternative B
Geology and Geologic Hazards					
High Erosion Potential	Increased erosion and slope instability by disturbance to soils on slopes ≥ 15% with high erosion potential of 203.1 acres and disturbance of 529.1 acres to soils with high erosion potential	Impact similar to No Action with increased surface disturbance in 974.3 acres on slopes ≥ 15% and increased surface disturbance in 1,167.7 acres of soils with high erosion potential	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action with increased surface disturbance in 478.5 acres on slopes ≥ 15% and increased surface disturbance in 1,390.0 acres of soils with high erosion potential
Mineral Depletion	Depletion of the 6 to 9 trillion cubic feet by drilling 1,139 new wells	Depletion of 20 to 25 trillion cubic feet by drilling 4,399 new wells	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to Alternative B
Paleontological Resources					
Blue Rim Area	Loss, damage, or destruction of fossils in the Blue Rim Area by additional surface disturbance of 529.1 acres	Impact similar to No Action with additional surface disturbance in the Blue Rim Area of 1,167.7 acres	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action with additional surface disturbance in the Blue Rim Area of 1,390.0 acres
Groundwater Resources					
Aquifer Depletion	Removal of 2,280 acre-feet of water to drill 1,139 wells could lead to temporary depletion of the Wasatch Formation aquifer	Impact similar to No Action 2011 with 8,800 acre-feet of water required to drill 4,399 wells	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to Alternative B
Surface Water					
Sediment Yield	The amount of surface disturbance in six hydrologic basins will at least double with increased annual sediment yields by 10 percent above current conditions	Impact similar to No Action with increased surface disturbance with increased annual sediment yields by 20 percent above current conditions	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to Alternative B
Soil Resources					
High Erosion Potential	Disturbance to sensitive soils with high erosion potential and low revegetation capabilities of 529.1 acres	Impact similar to No Action with increased surface disturbance of 1,167.7 acres of sensitive soils	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action with increased surface disturbance of 1,390.0 acres of sensitive soils
Steep Slopes	Disturbances to soils on slopes ≥ 15% with high erosion potential of 203.1 acres	Impact similar to No Action 2011 with increased surface disturbance of 974.3 acres on slopes ≥ 15%	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action 2011 with increased surface disturbance of 478.5 acres on slopes ≥ 15%
Sedimentation	Increased soil erosion and sedimentation in aquatic habitats (up to 10 percent over current conditions)	Impact similar to No Action with erosion and sedimentation up to 10 percent over current conditions	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to Alternative B
Vegetation Resources					
Native Vegetation	Removal of existing native vegetation of 4,123.1 acres of surface disturbance in native vegetation	Impact similar to No Action with increased surface disturbance of 12,885.6 acres in native vegetation	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action with increased surface disturbance of 10,427.0 acres in native vegetation
Shrub and Tree Dominated Vegetation	Surface disturbance in native vegetation dominated by shrubs and trees would be converted to herbaceous vegetation 3,172.0 acres of sagebrush steppe, 69.2 acres of greasewood, 251.3 acres of desert shrub, and 68.4 acres of riparian forest and shrub	Impact similar to No Action with increased surface disturbance in vegetation dominated by shrubs and trees (10,117.2 acres of sagebrush steppe, 218.8 acres of greasewood, 629.6 acres of desert shrub, and 181.1 acres of riparian forest and shrub)	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action with increased surface disturbance in vegetation dominated by shrubs and trees (7,988.0 acres of sagebrush steppe, 213.6 acres of greasewood, 709.5 acres of desert shrub, and 121.1 acres of riparian forest and shrub)

Resource	No Action Alternative	Alternative B	Alternative C	Alternative D	Alternative E
Nonnative Invasive Species	Unsuccessful revegetation with increased presence of noxious weeds (Canada thistle, perennial pepperweed) on un-reclaimed bare ground (4,123.1 acres)	Impact similar to No Action with increased surface disturbance and potentially more un-reclaimed bare ground (12,885.6 acres)	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action with increased surface disturbance and potentially more un-reclaimed bare ground (10,427.0 acres)
Grazing Resources					
Grazing Capacity	Loss of livestock grazing capacity (AUMs) by removal of existing native vegetation of 4,123.1 acres	Impact similar to No Action with increased surface disturbance in 12,885.6 acres of native vegetation	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action with increased surface disturbance in 10,427.0 acres of native vegetation
Nonnative Invasive Species	Potential for decreased grazing capacity with increased presence of noxious weeds (Canada thistle, perennial pepperweed) on un-reclaimed bare ground	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative
Wetlands, Riparian Resources and Flood Plains					
Wetlands	Potential loss of wetlands due to construction of linear facilities	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative
Riparian Resources	Increased sedimentation in aquatic habitats with loss of 68.9 acres of forest-dominated riparian and shrub vegetation	Impact similar to No Action but increased surface disturbance of 183.9 acres in forest-dominated riparian and shrub vegetation	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased surface disturbance of 122.1 acres in forest-dominated riparian and shrub vegetation
Flood Plains	Surface disturbance within 100-year flood plain of 179.1 acres with potential loss of flood plain function	Impact similar to No Action but increased surface disturbance of 486.8 acres in 100-year flood plain	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased surface disturbance of 330.7 acres in 100-year flood plain
Threatened, Endangered Species and Special Status Species					
	Groundwater withdrawals for drilling, possible average annual depletion of 463.5 acre-feet from Colorado River System	Impact similar to No Action but increased average annual depletion of 467.5 acre-feet from Colorado River System	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but decreased, average annual depletion of 327.6 acre-feet from Colorado River System
Bald Eagle Wintering-Feeding-Sheltering Habitat	Surface disturbance and associated human presence within 1 mile of the New Fork Riparian zone (584.8 acres) and potential affects to forested-dominated riparian habitat (68.4 acres)	Impact similar to No Action but increased – 1,943.8 acres within 1 mile of the New Fork Riparian zone and 181.6 acres disturbed in forest –dominated riparian habitat	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased – 1,454.4 acres within 1 mile of the New Fork Riparian zone and 121.1 acres disturbed in forest –dominated riparian habitat
Other Special Status Wildlife Species	Direct effects to species depending on upland habitats (sagebrush steppe, mixed grass prairie, greasewood and desert shrub) (3,800 acres) as well as forest-dominated riparian habitats (potentially 68.4 acres)	Impact similar to No Action but increased – disturbance to upland habitat of 11,956 acres, forest-dominated riparian habitats of 181.6 acres	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased – disturbance to upland habitat of 10,425 acres, forest-dominated riparian habitats of 121.1 acres
Special Status Fish Species	Increased sedimentation in aquatic habitats (up to 10 percent over current conditions)	Impact similar to No Action but increased - up to 20 percent increase in sedimentation to aquatic habitats	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to Alternative B
Special Status Plants	Direct effects to existing populations by surface disturbance in Blue Rim Area – surface disturbance of 529.1 acres	Impact similar to No Action but increased – surface disturbance of 1,167.7 acres	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased – surface disturbance of 1,390.0 acres
Wildlife and Aquatic Resources					
All terrestrial wildlife species	Creation of barriers to movement, edges, and patches within former contiguous habitats. The total pad perimeter of 253.3 miles due to 249 new pads with total edge length of 496.3 miles	Impact similar to No Action but increased - pad perimeter of 370.3 miles due to 250 new well pads, total edge length of 1,106.4 miles	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased - pad perimeter of 418.9 miles due to 415 new well pads, total edge length of 815.7 miles
	Direct effects to species depending on upland habitats (sagebrush steppe, mixed grass prairie, greasewood and desert shrub) (3,800 acres) as well as forest-dominated riparian habitats (potentially 68.4 acres)	Impact similar to No Action but increased – disturbance to upland habitat of 11,956 acres, forest-dominated riparian habitats of 181.6 acres	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased – disturbance to upland habitat of 10,425 acres, forest-dominated riparian habitats of 121.1 acres
Pronghorn	Direct loss of crucial winter range by surface disturbance (1,260.7 acres)	Impact similar to No Action but increased surface disturbance (3,519.3 acres)	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased surface disturbance (3,618.3 acres)
	Direct loss of spring/summer/fall range by surface disturbance (2,862.4 acres)	Impact similar to No Action but increased surface disturbance (9,366.3 acres)	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased surface disturbance (6,808.7 acres)
	Decreased habitat function near roads and well pads due to human presence – 249 well pads and 99.6 miles of road	Impact similar to No Action but 250 well pads and 100 miles of road	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to Alternative B
	No year-round development in crucial winter range during winter	Drilling on crucial winter ranges during winter in the Alternative B Core Area	Drilling on crucial winter ranges during winter in the Alternative C Core Area with the exception of DA-5	Drilling on crucial winter ranges during winter in the Alternative D Core Area	Impact similar to No Action Alternative

Resource	No Action Alternative	Alternative B	Alternative C	Alternative D	Alternative E
Mule Deer	Direct loss of crucial winter range by surface disturbance (1,174.6 acres)	Impact similar to No Action but increased surface disturbance (4,593.3 acres)	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased surface disturbance (2,285.6 acres)
	Decreased habitat function near roads and well pads due to human activity – 249 well pads and 99.6 miles of road	Impact similar to No Action but increased – 250 well pads and 100 miles of road	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased – 415 well pads and 166 miles of road
	Limited year-round development in crucial winter range during winter as stated in BLM's 2004 Decision Record	Drilling on crucial winter ranges during winter in the Alternative B Core Area	Drilling on crucial winter ranges during winter in the Alternative C Core Area except for DA-5	Drilling on crucial winter ranges during winter in Alternative D Core Area	Impact similar to No Action Alternative
Moose	Direct loss of crucial winter/yearlong range by surface disturbance (210.2 acres)	Impact similar to No Action but increased surface disturbance (603.0 acres)	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased surface disturbance (404.4 acres)
	Continued drilling on crucial winter range on non-federal lands/minerals during winter	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative
Greater Sage-Grouse	No surface disturbance or human presence within 0.25 mile of leks during breeding	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative	Impact similar to No Action Alternative
	Decreased habitat function at leks and within 2 miles in nesting and brood-rearing habitat by surface disturbance (3,161.1 acres) and human activity	Impact similar to No Action but increased surface disturbance (9,822.6 acres)	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased surface disturbance (8,128.4 acres)
	Decreased habitat function near roads and well pads due to human activity – 245 well pads and 99.6 miles of road	Impact similar to No Action but increased – 250 well pads and 100 miles of road	Impact similar to Alternative B	Impact similar to Alternative B	Decreased habitat function near roads and well pads due to human activity – 415 well pads and 166 miles of road
	Fragmentation and loss of contiguous sagebrush steppe habitat by surface disturbance (3,172.0 acres)	Impact similar to No Action but increased surface disturbance (10,117.2 acres) in sagebrush steppe	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased surface disturbance (7,988.0 acres) in sagebrush steppe
	Limited drilling within 2 miles of occupied greater sage-grouse leks during seasonal restricted periods – federal lands/minerals only.	Drilling within 2 miles of occupied greater sage-grouse leks during seasonally restricted periods in the Alternative B Core Area.	Drilling within 2 miles of occupied greater sage-grouse leks during seasonally restricted periods in the Alternative C Core Area with the exception of DA-5	Drilling within 2 miles of occupied greater sage-grouse leks during seasonally restricted periods in the Alternative D Core Area	Impact similar to No Action Alternative
Small Game and Fur-Bearing Mammals	Fragmentation and direct loss of native habitats by surface disturbance (4,123.1 acres)	Impact similar to No Action but increased surface disturbance (12,885.6 acres)	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased surface disturbance (10,427.0 acres)
Migratory Birds	Decreased habitat function in fragmented habitats and along edges of well pad perimeters of 253.3 miles for 249 pads.	Impact similar to No Action but increased pad perimeter of 370.3 miles for 250 pads	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action but increased pad perimeter of 418.9 miles for 415 pads
	Decreased habitat function near roads due to edges and human activity ≈ 99.6 miles of road and 99.6 miles of pipeline corridor	Impact similar to the No Action but increased with 100 miles of road and 100 miles of pipeline corridor	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to the No Action but increased with 166 miles of road and 166 miles of pipeline corridor
	Fragmentation and loss of contiguous sagebrush steppe habitat by surface disturbance (3,172.0 acres) in habitats used by sagebrush-obligate species	Impact similar to the No Action but increased surface disturbance (10,117.2 acres) in sagebrush steppe	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to the No Action but increased surface disturbance (7,988.0 acres) in sagebrush steppe
	Decreased raptor nesting habitat effectiveness with 68.4 acres of surface disturbance within forest-dominated riparian vegetation and 584.8 acres disturbed within 1 mile of New Fork riparian zone	Impact similar to the No Action but increased surface disturbance (181.6 acres) in forest-dominated riparian vegetation and 1,943.8 acres disturbed within 1 mile of New Fork riparian zone	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to the No Action but increased surface disturbance (121.1 acres) in forest-dominated riparian vegetation and 1,454.4 acres disturbed within 1 mile of New Fork riparian zone
Aquatic Resources	Decreased reproductive success in spring-spawning native salmonid species from increased sedimentation in aquatic habitats (up to 10 percent over current conditions) and loss of 68.9 acres of forest-dominated riparian forest and shrub vegetation	Impact similar to No Action with increased sedimentation up to 20 percent over current conditions and increased loss of 183.9 acres of forest-dominated riparian and shrub vegetation	Impact similar to Alternative B	Impact similar to Alternative B	Impact similar to No Action with increased sedimentation up to 20 percent over current conditions and increased loss of 122.1 acres of forest-dominated riparian and shrub vegetation

two well pads per section, then that would become part of the core area. None of the seasonal restrictions for wildlife would apply to the core area. Exceptions would be allowed outside of the core area. There would be no requirement for Tier 2 equivalent emission controls on drilling rig engines. This Alternative was considered but not analyzed in detail for the following reasons:

- this Alternative would have no provisions for Tier 2 equivalent emission controls on drilling rigs. Previous air quality impact analysis (BLM, 2006c) has shown that at least some control of drilling rig emissions is required for this level of development due to the proximity of the PAPA to the Bridger Wilderness Area; and
- under this Alternative, there would be no provision for consolidating development to allow for areas with no drilling activity during seasonal restrictions along the Anticline Crest.

2.4.5.2 Reduced Pace of Development Alternative

A Reduced Pace of Development Alternative was originally considered but not analyzed in detail in the Draft SEIS (BLM, 2006a). Based on public comment on the Draft SEIS, this Alternative has now been analyzed in detail as Alternative E. The No Action Alternative does have the elements of a reduced pace of development; however, it is carried forward only through 2011. Alternative E includes 4,399 additional wells which allows for a similar comparison to other action Alternatives.

2.4.5.3 Alternative Pipeline Corridor and Sales Pipeline Alignment

An alternative route for BCC, R6 Pipeline (Segment 1) and the PBC Pipeline was initially considered. The alternative route deviated from the proposed route at approximate milepost 12.1 and returned to the proposed route at milepost 17.1 (see Map 2.4-2). The 6.4-mile long segment would replace 5.0 miles of the proposed route. The alternative route was considered but not analyzed in detail for the following reasons:

- a 500-foot corridor would be required for two large diameter pipelines with 120-foot construction rights-of-way, which is unavailable along the alternative route and this would render the route infeasible,
- there is one greater sage-grouse lek within 0.25 mile, and one lek within 2 miles, of the alternative alignment and there would have been seasonal restrictions on pipeline construction potentially resulting in additional impacts,
- the length of the alternative pipeline segment between the two points of deviation was longer than the proposed route's segment; therefore, there would be less surface disturbance to vegetation, soils, and wildlife habitat, and overall, less environmental impact by using the proposed route, and
- there are fewer sensitive cultural resources along the proposed route in comparison to the alternative route.

2.4.6 BLM Preferred Alternative

In accordance with NEPA, federal agencies are required by CEQ (40 CFR §1502.14) to identify their Preferred Alternative for a project in the Draft, if a preference has been identified, and in the Final prepared for a project. The Preferred Alternative is not a final agency decision; rather, it is an indication of the agency's preference.

The BLM has selected the Preferred Alternative based on the analysis in this Revised Draft SEIS as well as on comments received during the public comment period on the Draft SEIS (BLM, 2006a). The Preferred Alternative is the Alternative that best fulfills the agency's

statutory mission and responsibilities of sustaining the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations while considering economic, environmental, technical, and other factors.

The BLM has determined that the Preferred Alternative is Alternative D as described in Section 2.4.3, including the environmental protection measures as identified in Appendices 4, 5D, 8D, 9C, 10, and 11.