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Bureau of Land Management
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Environmental Assessment for the Questar Year-Round Drilling Proposal, Sublette County, Wyoming

MISSION STATEMENT

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

WY-100-EA05-034

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CHAPTER ONE
INTRODUCTION

1.1 Introduction

The U.S. Department of the Interior, Bureau of Land Management (BLM), and State of Wyoming (as a cooperating agency) prepared this Environmental Assessment (EA) to evaluate impacts which could result from year-round drilling in mule deer winter range and in sage grouse breeding and nesting habitats[1] in a portion of the Pinedale Anticline Project Area (PAPA) in Sublette County, Wyoming.[2] This EA also evaluates impacts from construction of a 107-mile long condensate[3] pipeline in Sublette, Lincoln and Sweetwater counties.

In 2000, BLM completed an extensive Environmental Impact Statement (hereafter, the PAPA EIS) for natural gas exploration and development in the 197,345-acre PAPA (BLM, 1999a and 2000a) and issued a Record of Decision (ROD) in July, 2000 (BLM, 2000b). To date, exploration and development has followed the conditions set forth in the ROD. However, the PAPA EIS did not evaluate impacts to mule deer or sage grouse from year-round drilling on winter ranges or in breeding and nesting habitats. Although the PAPA EIS did evaluate a gas sales pipeline, a condensate pipeline was not contemplated by the operators at the time the EIS was prepared.

Based on experience gained during the four years following completion of the PAPA EIS, an ongoing evaluation of overall project economics, and recent advances in drilling technology, Questar Exploration and Development Company (Questar) proposes to modify its strategy for future development of its 14,800-acre leasehold in the PAPA. Questar believes it can develop the majority of its remaining lease acreage by constructing 9 additional well pads (using multiple wells drilled from a single pad) and drilling from 52 existing well pads constructed after completion of the PAPA EIS. To shorten the period necessary to develop their leases and to provide for more economically-attractive drilling rig utilization, beginning in the winter of 2004, Questar proposes to begin year-round drilling within their leases in the northern portion of the PAPA.

Questar's leasehold lies entirely within Wyoming Game and Fish Department (WGFD)-designated mule deer crucial winter range or areas managed by BLM as mule deer crucial winter range and contains breeding and nesting habitat for sage grouse. To date, BLM has granted two exceptions that allowed winter drilling in mule deer winter range from a single well pad using a single drilling rig to accommodate research on mule deer winter movement. BLM has also granted exceptions within sage grouse breeding and nesting habitat during critical periods for a few days when BLM biologists have determined sage grouse were not present in the habitat.

Questar's proposal includes year-round drilling in mule deer winter range and sage grouse breeding and nesting habitats from 9 new and 52 existing well pads. During critical periods for mule deer and sage grouse, Questar proposes to limit drilling activities to 3 new or existing well pads. During the 9 years Questar anticipates is necessary to complete development of their leasehold, winter drilling could occur from 27 well pads (3 well pads each winter). Consistent with the PAPA ROD, drilling outside the critical periods for mule deer and sage grouse could occur from any of the 9 new or 52 existing well pads within Questar's leasehold.

Questar also proposes to construct a pipeline to transport condensate from the PAPA to sales facilities in Sweetwater County. Currently, condensate is trucked from each production facility in the PAPA.

While it is generally agreed that construction of the condensate pipeline will reduce current impacts from development within the PAPA by significantly reducing overall truck traffic and eliminating the need for on-site storage of condensate, year-round drilling in mule deer winter range and in sage grouse breeding and nesting habitats is controversial and warrants thorough assessment (which is the purpose of this EA).

Management of big game and sage grouse in Wyoming is the sole responsibility of WGFD. Because of their expertise, BLM coordinated closely with WGFD during development of this EA. In a June 17, 2004 letter to BLM (see Appendix A), WGFD stated:

- Although WGFD has historically recommended the wide-spread use of seasonal stipulations, WGFD does not consider seasonal stipulations as the exclusive approach to species conservation and management;

[1] For ease of comparison, this EA utilizes terminology consistent with the PAPA EIS and ROD. Sage grouse refers to Greater sage-grouse and mule deer winter range includes crucial and winter/yearlong range described and mapped in the PAPA ROD.

[2] Typically, BLM prohibits drilling in these habitats through seasonal occupancy stipulations to avoid disturbance to these species and their habitats during critical periods.

[3] Wells in the PAPA produce a mixture of gas, produced water and liquid petroleum products (condensate). The liquids separate from the gas when the pressure on the gas stream is reduced during production at the wellhead.

- WGFD does not consider seasonal stipulations as providing the best or most comprehensive benefit for mule deer and sage grouse in the PAPA; and
- WGFD has determined that Questar's proposed mitigation offers an alternative to the standard seasonal stipulations that will be more beneficial to wildlife.

WGFD's conclusions are based on Questar's proposal to: 1) utilize more centralized production; 2) decrease total habitat disturbance and fragmentation; 3) reduce traffic and its concomitant impacts; and 4) consult with WGFD on the locations of year-round and new well pads to avoid sage grouse leks and other key habitat areas and features. In its June 17, 2004 letter, WFGD concluded that implementation of Questar's proposal, in its entirety, would result in more benefits to fish and wildlife than would be afforded by only applying seasonal stipulations.

WGFD has clearly stated that their conclusions are based on site-specific conditions on Questar's leasehold in the PAPA and additional mitigation measures proposed by Questar and may not apply to any future year-round drilling proposals.

The purpose of this EA is not to repeat information contained in the PAPA EIS. Rather, this EA focuses on those resource impacts that are different (either in location, magnitude, or timing) than those described in the PAPA EIS.

Questar's year-round drilling proposal will occur entirely within the geographic area evaluated in the PAPA EIS. And, because winter drilling affects only the time of the year when the impacts will occur rather than the areal extent and the general magnitude of the impact to resources, this EA will be limited to addressing only those resource impacts that are timing-dependent.

The PAPA EIS addressed construction of a gas sales pipeline between the PAPA and Granger and Opal, Wyoming. That gas sales pipeline has been constructed. The condensate pipeline proposed by Questar will generally follow the same route as the gas sales pipeline and many of the impacts are expected to be similar to those disclosed in the PAPA EIS. Questar's condensate pipeline is aligned within the 200-foot wide gas sales pipeline analysis corridor for approximately 21 percent of its route. However, because the condensate line represents additional impacts (beyond those that occurred during installation of the gas sales pipeline), all potential resource impacts and benefits from the condensate line are evaluated in this EA.

Overall, Questar's proposal will reduce air pollutant emissions from the PAPA. However, BLM is aware that ongoing development of the PAPA may result in levels of emissions that exceed those evaluated in the PAPA EIS. BLM and the Wyoming Department of Environmental Quality (WDEQ) are working with an air quality advisory group to determine if additional air quality analysis is necessary.

1.2 Purpose and Need

The Mineral Leasing Act requires that all public lands, not specifically closed, be open to lease for the exploration and development of mineral resources. Questar has a lease from the Federal government for exploration and development of minerals in the PAPA. The purpose of Questar's proposal is to continue development of gas resources from existing leases in the PAPA while incorporating new technologies to lessen the impacts originally estimated and analyzed in the PAPA EIS. From the government's standpoint, development of Questar's leasehold will supply ever-increasing energy demands, particularly for natural gas. In addition, continued development is necessary to produce and sell the mineral resources from which the government collects royalties paid by Questar on natural gas and condensate produced from wells. Questar's purpose for developing the field is to make a profit for the company and its shareholders and to provide for the country's energy needs.

One of the primary objectives of Questar's proposal is impact reduction. This will be accomplished by:

- Shortening the overall time frame for development of Questar's leased acreage from 18 to 9 years;
- Significantly reducing truck traffic and related impacts to air quality, traffic, dust, noise, etc. in the PAPA by piping condensate to sale. Questar estimates that construction of the condensate line and a produced water pipeline (analyzed in a separate right-of-way document) would eliminate more than 25,000 tanker truck trips annually when Questar's leases are at peak production;
- Lowering the annual peak level of drilling activity in the PAPA by allowing year-round drilling rather than condensing all drilling into the summer;
- Adding benefit to wildlife in the vicinity of the PAPA through the mitigation measures (including habitat mitigation elsewhere in their leasehold) offered by Questar. According to WGFD, the overall benefit to wildlife offered by Questar's proposal exceeds the benefits associated with continuing the seasonal stipulations.

1.3 Authorizing Actions and Relationships to Statutes and Regulations

BLM is not the only agency which must issue approvals for Questar's proposal. A list of permits, approvals and authorizing actions necessary to

construct, operate, maintain and abandon project-related facilities is provided in Table 1-1. The PAPA EIS (BLM, 1999a) contains complete descriptions of the regulatory programs listed in Table 1-1 as well as their applicability to oil and gas activities in the PAPA. For additional information regarding these regulatory programs, please refer to the PAPA EIS.

Table 1-1
Federal, State and Local Permits, Approvals and Authorizing Actions Necessary for Construction, Operation, Maintenance and Abandonment of Questar's Proposed Action and Alternatives [1]

Issuing Agency/Permit Name	Nature of Permit/Approval	Authority
Bureau of Land Management Permit to Drill, Deepen or Plug Back (APD/Sundry process)	Controls drilling for oil and gas on Federal onshore lands	Mineral Leasing Act of 1920 (30 U.S.C. 181 *et seq.*); 43 CFR 3162
Rights-of-way Grants and Temporary Use Permits	Right-of-way grants on Federal lands	Mineral Leasing Act of 1920 as amended (30 U.S.C. 185); 43 CFR 2880
Rights-of-way Grants and Temporary Use Permits	Right-of-way grants on Federal lands	Federal Land Policy and Management Act of 1976 (43 U.S.C. 1761 - 1771); 43 CFR 2800
Antiquities, Cultural and Historic Resource Permits	Issue antiquities and cultural resources use permits to inventory, excavate or remove cultural or historic resources from Federal lands	Antiquities Act of 1906 (16 U.S.C. Section 431-433); Archaeological Resources Public Protection Act of 1979 (16 U.S.C. Sections 470aa - 47011); 43 CFR Part 3; Section 106 of the National Historic Preservation Act.
Approval to Dispose of Produced Water	Controls disposal of produced water from Federal leases	Mineral Leasing Act of 1920 (30 U.S.C. 181 *et seq.*); 43 CFR 3164; Onshore Oil and Gas Order No. 7
U.S. Army Corps of Engineers Section 404 Permit (Nationwide and Individual)	Controls discharge of dredged or fill materials into waters of the United States.	Section 404 of the Clean Water Act of 1972 (33 USC 1344)
U.S. Fish and Wildlife Service Consultation Process, Endangered and Threatened Species	Biological Assessment	Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. *et seq.*)
Wyoming Department of Environmental Quality Water Quality Division Notice of Intent - Storm Water Discharge Permit Temporary Discharge Permits	Controls off-site storm water runoff from construction activities resulting in 1 acre or more of disturbance	Wyoming Environmental Quality Act; Section 405 of the Clean Water Act (40 CFR Parts 122, 123 and 124); WDEQ Water Quality Rules and Regulations, Chapter 18
Air Quality Division Permits to construct and operate Notice of Installation	Regulates emissions from project components Notification of Potential Emissions from production equipment	Wyoming Air Quality Standards and Regulations WDEQ Rules and Regulations
Wyoming Department of Transportation Oversize and Overlength Load Permits Utility Permit Access Permit	Permits for oversize, overlength and overweight loads Highway pipeline crossing Highway access construction	Chapters 17 and 20 of the Wyoming Department of Transportation Rules and Regulations Title 12: Code of Civil Procedures, Chapter 26: Eminent Domain Rules and Regulations for Access Driveways as Approved by the Wyoming Highway Commission
Wyoming Oil and Gas Conservation Commission Permit to Drill, Deepen or Plug Back (APD process)	Regulates drilling of all oil and gas wells in the state	Wyoming Oil and Gas Conservation Commission (WOCGG) Regulations Chapter 3, Section 8. W.S. 30-5-104 (d)(i)(C). W.S. 30-5-115.
Well location (part of the APD process).	Regulates downhole well location of all oil and gas wells by reservoir or pool.	WOGCC Rule: Chapter 3 Section 2, W.S. 30-5-109

Table 1-1. Concluded		
Issuing Agency/Permit Name	**Nature of Permit/Approval**	**Authority**
Protection of surface waters and productive formations (part of APD process).	Provides general drilling, casing and cementing rules for oil and gas wells.	WOGCC Rule: Chapter 3, Section 22.
Well control (part of APD process).	Provides requirements for blowout preventers.	WOGCC Rule: Chapter 3, Section 23.
Authorization approving drilling and spacing units	Regulates well spacing and pooling of interests by reservoir or pool.	W.S. 30-5-104(d)(ii)(F)(iv). W.S. 30-5-109(a),(b),(c) & (f).
Permit to drill to a nonstandard location	Provides for well relocation while maintaining existing well spacing	WOGCC Rule: Chapter 3, Section 3, W.S. 30-5-109
Permit to directionally drill	Provides the notification requirements for controlled directional drilling.	WOGCC Rule: Chapter 3, Section 25.
Plugging and abandonment of a well (applies to nonfederal lands)	Provides procedures and regulates the plugging and abandonment of oil and gas wells.	WOGCC Rule: Chapter 3, Section 18, Chapter 4, Section 2. W.S. 30-5-104 (d)(vi)(B)
Measurement of oil and gas production.	Regulates the measurement and reporting of oil and gas production	WOGCC Rule: Chapter 3, Section 30 and 31, W.S. 30-5-104 (d)(vi)(B)
Permit to complete a well in multiple zones or pools. (Commingling)	Regulates the production of oil and gas from more than one pool in one well.	WOGCC Rule: Chapter 3, Section 35.
Authorization to flare or vent gas	Regulates the safe venting or flaring of gas to prevent waste.	WOGCC Rule: Chapter 3, Section 40.
Permit to use an earthen pit (applies to nonfederal lands)	Regulates construction, use and closure of noncommercial reserve, production and emergency pits on drilling and producing locations.	WOGCC Rule: Chapter 4, Section 1, W.S. 30-5-104 (d)(vi)(A)
Spills and fires	Requires notification, with a prevention and cleanup plan, of accidental deaths, fires or releases of 10 or more barrels of nonpotable fluids which enter or threaten the waters of the State.	WOGCC Rule: Chapter 4, Section 3.
Workmanlike operations	Regulates the safety and environmental protection of well production facilities.	WOGCC Chapter 4, Section 4.
Permit underground disposal of water	Regulates the noncommercial underground disposal of nonpotable water and oil field wastes.	WOGCC Chapter 4, Section 5, W.S. 30-5-104 (d)(vi)(B)
Permit to close a natural gas processing facility	Regulates closure of infield gas gathering and processing facilities.	WOGCC Rule: Chapter 4, Section 13 (b).
Wyoming Department of Employment Workers Safety and Compensation Division	Provides the rules and regulations governing the health and safety of employees and employers of oil and gas drilling and servicing, includes equipment spacing, lighting requirements, hours of operation and other items pertinent to pad size and design.	W.S. 27-11-105
Wyoming State Engineer's Office Water Well Permit	Grant permit to appropriate groundwater	W.S. 41-121 through 147
Wyoming State Lands and Investments	Right-of-way and easements on state lands	W.S. 36-9-118
Sublette County Planning and Zoning	Energy Pipeline Permit	
Planning and Zoning	Driveway Permit	

[1] This list is intended to provide only an overview of key regulatory requirements that would govern project implementation. Additional approvals, permits and authorizing actions could be necessary.

1.4 Decisions to be Made Based on this NEPA Analysis

BLM decision-makers will decide, based on the analysis contained in this EA, whether or not to authorize the Proposed Action or one of the alternatives including No Action.

1.5 Decisions to be Made Following this NEPA Process

The Decision Record associated with this EA will not be the final review or the final approval for all actions associated with development of Questar's leasehold. Although the Decision Record may approve modification of Questar's development program for their leasehold, the BLM must analyze and approve each component of the project that involves the disturbance of Federal lands on a site-specific basis. The method used to evaluate each surface-disturbing activity is the Application for Permit to Drill or right-of-way grant/special use permit which would be required before any construction can occur.

CHAPTER TWO
PUBLIC PARTICIPATION, ISSUES AND ALTERNATIVES

2.1 Introduction

The purpose of this chapter is to describe Questar's proposal (the Proposed Action) and reasonable alternatives developed by the BLM based on public and other agency comment and scoping. Questar's proposal and project alternatives developed by the BLM are based on two changes in development strategy that Questar has proposed for future development of their lease acreage in the PAPA:

- Year-round drilling on Questar's lease area in the PAPA; and
- Construction, operation and maintenance of a 107-mile long condensate pipeline.

This chapter will not repeat information contained in the PAPA EIS. The reader is encouraged to review the information contained in Chapter 2 of the PAPA EIS for additional technical descriptions regarding drilling techniques, construction of access roads and pipelines, etc.

2.2 Scoping, Consultation and Coordination

BLM has actively and directly solicited public involvement in its evaluation of Questar's proposal by circulating information through mailings, public announcements, and through a series of public and working group meetings with Federal and State resource specialists. The public has been provided opportunity to submit comments and recommendations by mail, over the telephone, by e-mail or in person. To date, BLM has received 80 responses from other regulatory agencies, interested groups and the public regarding Questar's proposal and/or the scope of the analysis contained in this EA. The substantive issues raised by the public, other agencies and interested groups are summarized below:[1]

General

- Successors in Questar's leases should be bound to mitigation.
- Identify mitigation and monitoring required for development to proceed, as well as the conditions under which mitigation and monitoring are to be implemented.
- Flexibility should be built into the decision that will allow for adaptive changes based on data gathered.
- Areas west of the Anticline Crest Road where Questar is not interested in drilling should be designated as no surface occupancy (NSO) or relinquish the leases to the BLM.
- Address whether the Pinedale Anticline Working Group (PAWG) process will apply to Questar. If PAWG determines that winter drilling must cease because of significant negative impacts to mule deer, Questar should cease winter drilling.
- Analyze year-round drilling PAPA-wide if other operators are going to submit similar proposals. Analyze all proposed winter drilling at one time, not in a piece-meal fashion.
- Conditions of approval need to be made clear to enforce proposal commitments.
- Fund a WDEQ oil and gas inspector for 5 years in the proposal area.

Alternatives

- Improvements (mitigation) and better drilling practices during the winter should be employed anyway, not just as leverage for winter drilling.
- One alternative that should be analyzed is implementing Questar's proposal in only the warm season with no winter drilling.
- A Wildlife Conservation Alternative should be analyzed in the EA that would include no winter drilling in crucial mule deer range, no waiver of sage grouse seasonal stipulations and no drilling in migration corridors.
- If it is determined that deviation angles of greater than 22 degrees is not practical on the Mesa, Questar should be asked to evaluate if it is possible to construct the 9 new well pads toward the end of the program. History suggests that deviating well technology will significantly improve before the end of the development program.

Historic Resources

- Minimize impacts to historical trails and their settings.

Grazing and Reclamation

- Commit to funding actions to ensure that grazing permittees affected by habitat improvement are made whole.

[1] Copies of public comment letters and emails are available for review at the BLM Pinedale Resource Area Office.

- State of the art reclamation efforts for revegetation of shrubs, forbs and grasses must be implemented and monitored.

Traffic

- Monitor traffic speeds to minimize impacts to wildlife and the public.

Soils and Water Quality

- Year-round drilling will create excessive erosion and salt loading to area streams.
- Year-round drilling will cause disturbance during critical soil stability periods.
- Address potential effects to surface water quality in riparian areas. Every effort to prevent erosion should be taken.

Wildlife

- Utilize latest wildlife research conducted in the PAPA. Disclose direct, indirect and cumulative impacts.
- The on-going deer study should be more intensive and comprehensive and include biological and physiological parameters that affect deer winter survival.
- Fund expanded mule deer study to make sure that the benefits of the mitigation are realized.
- Can a wildlife study be designed sensitive enough to determine the impacts associated with increased human activity?
- The money spent on the study would be better spent to fund habitat improvement.
- Integrate a comprehensive habitat inventory into the mule deer study.
- Exclude big game winter range and big game migration corridors from year-round drilling.
- Does the current level of drilling activity with many rigs operating during the summer result in an overall benefit to the deer population that utilize the Mesa?
- Address impacts on elk because the brucellosis outbreaks and potential elk feedground phase-outs may encourage more elk to move through the PAPA.
- Identify important sage grouse habitat and appropriate mitigative measures to minimize potential impacts. Evaluate long-term and cumulative effects on sage grouse. Prohibit important habitat loss or degradation.
- Clarify that NSO stipulations for sage grouse are not being waived by the proposal.
- Relaxing timing stipulations on sage grouse breeding areas may result in the need to bus work crews out to drilling sites. Monitoring should be implemented.
- Is habitat preservation the most important consideration for the welfare of all wildlife that utilizes the Mesa?
- Will there be irretrievable impacts to wildlife that utilizes the Mesa?
- The spacing of rigs should be minimized or maximized to allow the largest area of un-impacted or un-fragmented wildlife habitat.
- The timing of shift changes and traffic should be coordinated to reduce stress on wildlife.
- BLM needs to consider future proposals, based on a worst-case opportunity, in order to have a clear understanding of what the loss of crucial winter range means.
- The proposal disregards recommendations of the WGFD Sage Grouse Conservation Plan.
- Identify habitat enhancement projects both inside and outside the development area with the WGFD, not just outside the development area as identified in the Scoping Notice.
- BLM should include water development projects as mitigation.
- Habitat enhancement projects should consider potential effects (beneficial and negative) to listed and proposed species, migratory birds and petitioned species.
- What will be done to facilitate habitat enhancement?

Well Spacing and Unitization

- How will the proposal affect reduced spacing to 20 acres or less on the Mesa? Will reduced spacing require more well pads, larger well pads than stated in the scoping notice?
- Consider unitization of the field.

Air Quality

- Address reduced completion efficiency. Flare-less completions may result in an inefficient completion of the well, resulting in the need for future in-fill drilling to effectively recover the gas resources.
- Analyze and compare emissions of flare-less completions techniques.
- Flare-less completions should be utilized 100 percent of the time.
- Analyze proposed emissions increases and decreases and compare emissions projected in the original Pinedale Anticline air quality (AQ) assessment. This will determine if additional air quality analysis or modeling is necessary.
- Did the original PAPA AQ analysis account for seasonal drilling restrictions? If so there will be increased winter emissions near Pinedale at a time when temperature inversions may prevent dispersion.

- Under the proposal the timing for drilling of the wells is cut from 18 years to 9 years. This doubles the annual emissions from Questar leases. Is this within the emissions modeled in the original analysis?
- How does the pace of development compare to the rate of development analyzed in the PAPA AQ modeling?
- Utilize best available control technology to minimize emissions. Best management practices should be implemented within the project area whenever possible.
- Utilize EPA tier 2 compliant drill rig engines or alternative fuel drill rig engines to reduce emissions over the next two years.
- Fund a Hazardous Air Pollutant assessment within the lease area at 5 locations.
- Fund and conduct 5 years of air quality monitoring (oxides of nitrogen, ozone, particulate matter and fugitive dust) in coordination with WDEQ.
- The BLM should consider the use of Adaptive Ecosystem Management and monitor the ambient air quality and potential impacts to air quality.

Cumulative Impacts

- The Pinedale Anticline EIS and ROD are outdated because they did not contemplate the number of wells that are projected for the Upper Green River Valley (as high as 10,000) and cannot be relied upon to fully disclose all impacts. Therefore it cannot satisfy NEPA for the purposes of tiering.
- The EA must address potential future Anticline infill projects.
- The effects of winter drilling were not analyzed in the Pinedale Anticline EIS and ROD, therefore these effects need to be analyzed including cumulative effects of the Jonah Infill.

2.3 Project Location

The 197,345-acre PAPA is located in west-central Wyoming in Sublette County. The town of Pinedale is situated on the northern end of Questar's lease area. Pinedale is located approximately 80 highway miles south of Jackson Hole and 100 miles north of Rock Springs. Other communities/settlements in the general vicinity of the project area include Cora, Daniel, Boulder, Bargerville, Marbleton and Big Piney (see Figure 2-1).

Generally, the PAPA lies between U.S. Highway 191 and the Green River. The project area is dominated by sagebrush and high desert vegetation blending with riparian areas and wetlands associated with the New Fork and Green River floodplains. The sagebrush covered higher elevation area between the rivers in the northern half of the PAPA is known locally as the "Mesa".

U.S. Highway 191 is the primary access to the PAPA and generally runs along the eastern and northern edges of Questar's lease area. It is a primary route for tourist travel to Yellowstone and Teton National parks and Jackson Hole. U.S. Highway 189 runs west of the PAPA and State Highway 351 crosses through the southern portion of the PAPA.

Although no national forest lands are located in the PAPA, the Bridger-Teton National Forest is located west, north and east of the PAPA. At their closest, national forest lands are approximately 2.3 miles from the northern boundary of the PAPA at Fremont Lake.

2.4 Questar's Proposed Action

2.4.1 Year-Round Drilling

Questar leases in the northern portion of the PAPA (see Figure 2-2) consist of approximately 14,800 acres. The lease area includes 14,160 acres of Federal lands and minerals and 640 acres of State lands and minerals (Section 16, T. 32 N., R. 109 W.). Nearly all of Questar's lease area is sage grouse nesting and breeding habitat and/or mule deer winter range.

To date, 52 well pads have been developed on Questar's leases (including 8 well pads on State lands and minerals). Questar believes, based on experience gained since completion of the PAPA EIS, that most of their currently-undeveloped, potentially-productive acreage can be drained by constructing 9 additional well pads (see Figure 2-2) and drilling additional wells from the 52 existing well pads. However, Questar's proposal may not allow complete extraction of natural gas under the area described in the PAPA EIS as the "Breaks". Additional analysis would be required should Questar propose surface-disturbing activities within this area.

Questar proposes to directionally drill up to 20 wells (bottom holes) from each of the 9 additional well pads and from some existing well pads. During the winter for the next 9 years, Questar proposes to conduct year-round drilling from 3 well pads each year (for a total of 27 well pads over 9 years). Two rigs may be operating simultaneously on each well pad. Well completion will not occur during winter months. If drilling is completed in the winter, the well would be plugged and completion delayed until summer.

When multiple wells are drilled from a single well pad, it is necessary to increase the size of the well pad to accommodate activities associated with multiple

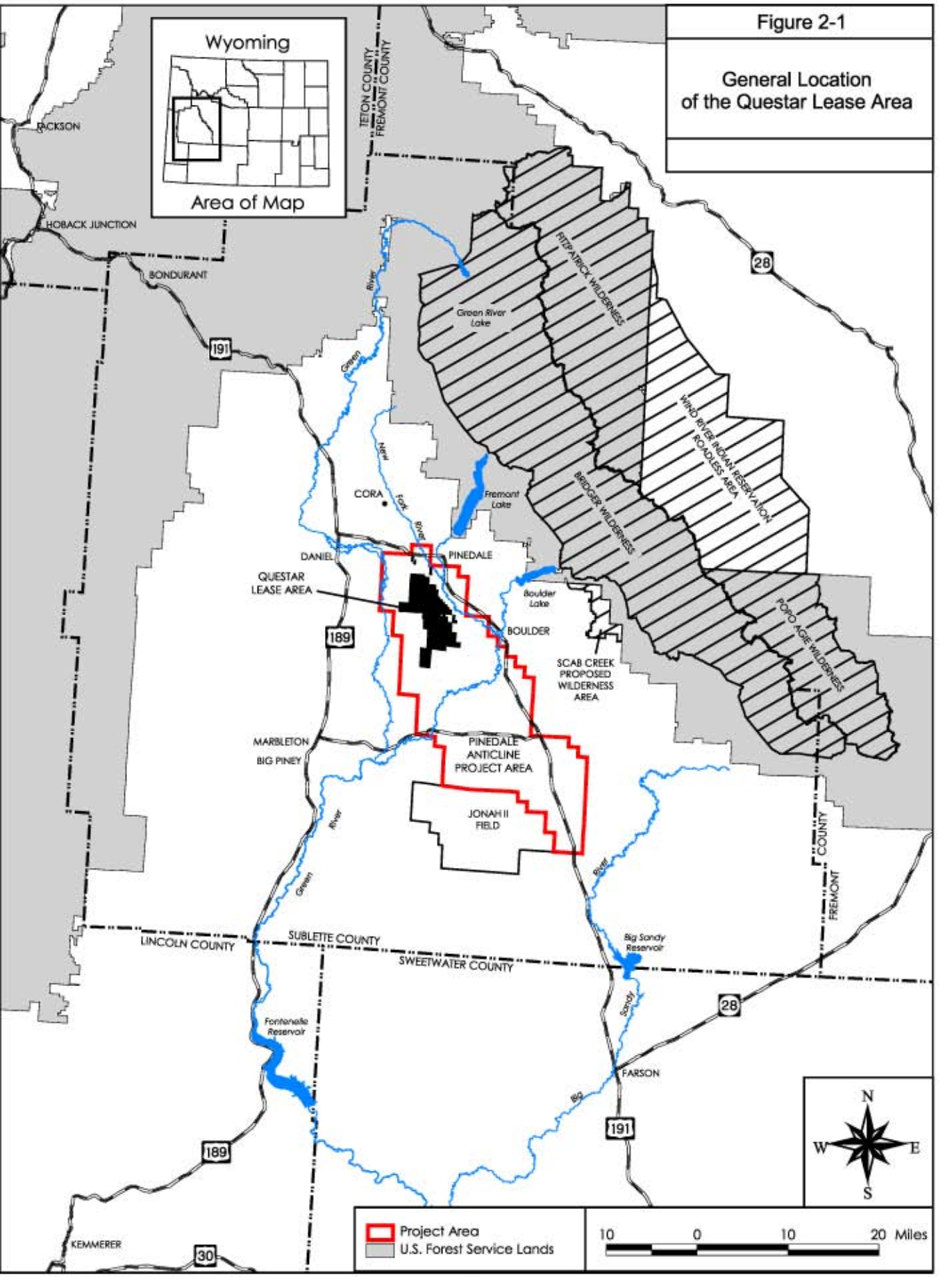
Figure 2-1
General Location of the Questar Lease Area
Wyoming
Area of Map
JACKSON
HOBACK JUNCTION
BONDURANT
TETON COUNTY
FREMONT COUNTY
FITZPATRICK WILDERNESS
WIND RIVER INDIAN RESERVATION ROADLESS AREA
BRIDGER WILDERNESS
POPO AGIE WILDERNESS
Green River Lake
Fremont Lake
Boulder Lake
CORA
DANIEL
PINEDALE
BOULDER
QUESTAR LEASE AREA
SCAB CREEK PROPOSED WILDERNESS AREA
MARBLETON
BIG PINEY
PINEDALE ANTICLINE PROJECT AREA
JONAH II FIELD
LINCOLN COUNTY
SUBLETTE COUNTY
SWEETWATER COUNTY
FREMONT COUNTY
Big Sandy Reservoir
Fontenelle Reservoir
FARSON
KEMMERER
Green River
New Fork River
Big Sandy
28
191
189
30
N
S
E
W
Project Area
U.S. Forest Service Lands
10 0 10 20 Miles

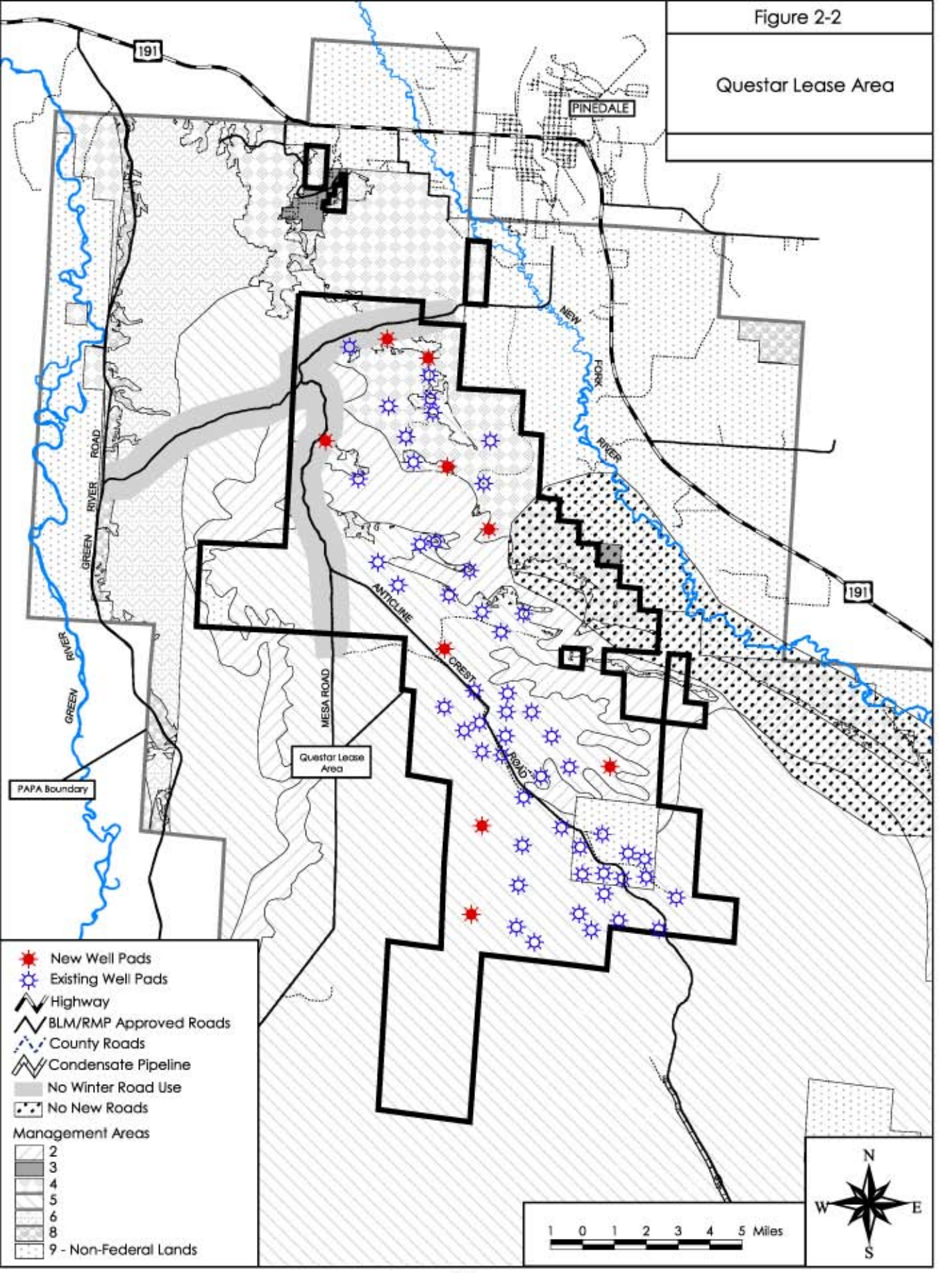
Figure 2-2
Questar Lease Area
191
PINEDALE
NEW
FORK
RIVER
GREEN
RIVER
ROAD
GREEN
RIVER
ANTICLINE
CREST
ROAD
MESA ROAD
Questar Lease Area
PAPA Boundary
New Well Pads
Existing Well Pads
Highway
BLM/RMP Approved Roads
County Roads
Condensate Pipeline
No Winter Road Use
No New Roads
Management Areas
2
3
4
5
6
8
9 - Non-Federal Lands
1 0 1 2 3 4 5 Miles
N
W
E
S

drilling rigs and production facilities. Based on site characteristics, individual well pads may need to be as large as 17 acres to accommodate up to 20 wells. In contrast, constructing single well pads for up to 20 wells would require disturbance of approximately 59 to 74 acres. In addition, centralizing all the well surface locations on a single pad eliminates the need to construct additional roads and gathering pipelines to individual well sites, further reducing disturbance and habitat fragmentation.

Constructing 9 additional well pads and expanding existing well pads is authorized by Section 2 of the PAPA ROD. However, year-round drilling on these well pads is not authorized by the ROD. Section 3 of the ROD precludes activities or surface use on big game crucial winter range from November 15 through April 30. Although the ROD allows BLM to grant exceptions to the seasonal stipulation, the ROD intended such exceptions to be applied on a well-by-well basis (which BLM has done) and did not contemplate that exceptions would be granted over an area as extensive as the Questar lease area.

Similarly, year-round drilling would not be consistent with the ROD's conditions of approval protecting sage grouse breeding and nesting habitat. Surface use and activities are generally prohibited in the vicinity of sage grouse leks between March 1 and May 15. Nesting habitat is protected from April 1 through July 31. If Questar's proposal is approved, surface use and disturbance would occur in both these habitats during the restricted periods.

The PAPA EIS and ROD designated the area included within Questar's leases as Management Areas (MA) 2, 3, 4, 5 and 9. Existing well pads developed on Questar's leases have been consistent with the MA objectives and restrictions/limitations contained in the ROD. The 9 additional well pads proposed by Questar are located in MAs 4 and 5. Questar's proposal does not affect the Breaks, which are identified as MA 2. The objectives of each of the MAs affected by Questar's proposed 9 additional well pads and restrictions/limitations for each MA implemented by the PAPA ROD are described below:

MA 4 – Sensitive Viewshed. This MA includes the "face of the Mesa" and areas currently identified in the Pinedale RMP as Visual Resource Management (VRM) Class II along the Green and New Fork rivers. Management objective of this area is to protect the sensitive viewshed by retaining the existing character of the landscape; management activities may be seen but should not attract the attention of the casual observer; construction activities should avoid steep slopes and sensitive soils to prevent erosion and visual impacts; maintain winter and crucial winter deer range, where present; protect cultural/Native American sacred sites; provide for development of recreation opportunities such as a bike, jogging, and/or hiking trail (so long as development of recreation opportunities is consistent with other components of the management objective); protect wetland/riparian areas; protect raptor nests and nesting habitat; and continue maintenance of livestock grazing and trailing operations.

The PAPA ROD placed limitations/restrictions on development within MA 4. These limitations and restrictions are summarized on Table 2-1. Questar's proposal would comply with the ROD limitations/restrictions placed on MA 4. The ROD allowed 28 well pads to be developed in the MA. To date, 7 well pads have been constructed in this MA. Questar's proposal would add an additional 3 well pads in MA 4, bringing the total number of well pads in the MA to 10.

Table 2-1 MA 4 Objectives and Restrictions/Limitations Contained in the PAPA ROD
To minimize impacts within the 8,686 Federal acres of sensitive viewshed and crucial deer winter range, the threshold of producing well pads allowed will be 28 within this MA (based on an average of two/square mile). The maximum number of pads/square mile will be four. However, pad drilling or centralized production facilities (CPFs) could be used to allow for additional well pads if no unnecessary or undue short- or long-term impacts to the sensitive viewshed will occur.
To the extent practicable, new roads will avoid the area of the Breaks and Sensitive Viewshed shown as "no new roads" on Figures 5 and 6 of the ROD. (See also Figure 2-2 in this EA). The installation of CPFs and/or employment of pad drilling will be required on Federal lands and minerals to screen tanks, other facilities and road and pipeline disturbance that could degrade the visual quality of the landscape areas and portions of U.S. Highway 191.
Approval of well pad locations, new roads or buried pipelines will be conditioned upon the operator developing a visual resource protection plan acceptable to BLM, for the mitigation of anticipated impacts.
Planning for wells within this MA will require additional public involvement and monitoring under the Adaptive Environmental Monitoring (AEM) planning process. Proposed project development (e.g., well pad, pipeline, CPFs, etc.) will require site-specific NEPA analysis that addresses the sensitive viewshed, wildlife, soils, visibility, recreation and any other affected resources.
Disturbance on slopes 10 percent or greater will be avoided on the face of the Mesa and on highly erosive soils or soils with a high degree of color contrast to prevent erosion, water quality degradation and visual contrast from disturbance.

The ROD identified an area of the Mesa as particularly sensitive to visual impacts. This area is shown as "no new roads" on Figure 2-2. The ROD stated that this area was to be generally avoided by surface disturbing

activities. Questar's proposal complies with the "no new roads" restriction.

For each Application for Permit to Drill (APD) in this MA, BLM will require Questar to prepare a visual resource mitigation plan. Using the criteria established in the ROD, during site-specific review of Questar's facilities, BLM will require that production facilities and road and pipeline disturbance that could degrade the visual quality of the landscape visible from portions of U.S. Highway 191 be screened to minimize visual impacts in this MA.

MA 5 - Big Game Crucial Winter Range and Sage Grouse Strutting and Nesting Habitat. This MA includes overlapping deer winter and crucial winter ranges and sage grouse strutting and nesting habitat on the top of the Mesa and slopes west toward the Green River and south/southeast to the New Fork River. This MA also includes an area of overlapping deer and antelope winter and crucial winter ranges and sage grouse strutting and nesting habitat south/southeast of the New Fork and East Fork rivers. The management objectives are to protect this area against excessive surface disturbance and increased human activities which could displace deer and antelope from winter ranges and sage grouse from strutting and nesting habitat resulting in mortalities and reduced population levels; protect cultural/Native American sacred sites; and continue maintenance of livestock grazing and trailing operations.

The PAPA ROD placed limitations/restrictions on development within MA 5. These limitations and restrictions are summarized on Table 2-2. Similar to MA 4, with the exception of seasonal restrictions to protect crucial deer winter range and sage grouse breeding and nesting habitat, Questar's proposal would comply with the ROD limitations/restrictions placed on MA 5. The ROD allowed 212 well pads to be developed in this MA. To date, 119 well pads have been constructed. Questar's proposal would add an additional 6 well pads in MA 5, bringing the total number of well pads to 125.

Questar's proposal would not increase the number of well pads/square mile beyond 16. Currently, the peak well pad density in MA 5 is 8 well pads/section (Section 8, T. 32 N., R. 109 W.).

During site-specific review of APDs within this MA, BLM would implement the same visual mitigation measures described above for MA 4.

In order for Questar to conduct year-round drilling, it would be necessary for equipment, materials and workers to travel to and from well pads on a daily basis. However, the ROD closed a portion of the Mesa Road in the PAPA to winter use to reduce impacts to big game (see Figure 2-2). Several of Questar's new well pads would be located adjacent to the closed portion of the Mesa Road. If BLM approves Questar's proposal, BLM would consult with WGFD to determine how access to the well pads could be achieved with the least impact to big game.

Table 2-2 MA 5 Objectives and Restrictions/Limitations Contained in the PAPA ROD
To minimize impacts within this 67,801 acre big game and sage grouse crucial habitat and visually sensitive areas, the threshold of producing well pads allowed will be 212 within this MA (based on an average of two/square mile). From 0 up to 16 well pads/square mile will be allowed to be constructed and drilled in any given section.
At more than 4 well pads/square mile, BLM may require the operators to pad drill (drill directionally from existing pads) any additional wells or to install CPFs on Federal lands and minerals. The operators will be required to demonstrate why either pad drilling or the installation of CPFs are not reasonable or practicable to eliminate production facilities (tanks, dehydration units, etc.) that require daily or weekly maintenance traffic at individual well locations. BLM will also use the results of monitoring/evaluation of resource impacts in determining the need/appropriateness of requiring pad drilling or CPFs.
To minimize impacts on Federal lands in the VRM Class III viewshed, authorization of well pad locations, new roads, CPFs, buried pipelines, compressor stations, etc. will be conditioned upon the operator developing and submitting a visual resource protection plan, demonstrating, to BLM's satisfaction, that the location and/or facilities meet VRM Class III management objectives to the extent reasonable and practicable.
Planning for project development within this MA will be processed on a case-by-case basis and will require periodic monitoring under the AEM planning process.
Proposed project development on Federal lands and minerals will require site-specific environmental analysis that addresses the impacts of the proposal on, among other resources, mule deer and antelope crucial winter range use, sage grouse strutting and nesting, highly erodible soils, and VRM Class II and III areas. Such environmental analysis will be used to locate well pads, access roads, pipelines, production facilities, CPFs, compressors, etc., in a manner that minimizes impacts to wildlife, protects erodible soils, and screens the disturbance and facilities from the view of residences and recreation activities along the Green and/or New Fork rivers, U.S. Highway 191 and Wyoming Highway 351 and to determine any seasonal use restrictions.

2.4.2 Condensate Pipeline

Questar proposes to construct a 6-inch diameter condensate pipeline and related facilities (including filters, screens, valves, pigging equipment, side taps, and metering equipment). The proposed pipeline would be buried to a minimum depth of 60 inches and would be located parallel and adjacent to existing pipelines for approximately 88 percent of it's total length. In a few places, the proposed pipeline would

leave existing adjacent pipeline rights-of-way to avoid environmentally-sensitive sites or facilities.

The condensate pipeline route is shown on Figure 2-3. The pipeline would head in a westerly direction from the existing Rocky Mountain Pipeline Facility in the SW of Section 5, T. 18 N., R. 112 W. (Sweetwater County), to the Blacks Fork Plant in the SW of Section 10, T. 18 N., R. 112 W. (Uinta County), and then in a northerly direction to the Pinedale No. 4 well site in the PAPA in the NW of Section 34, T. 32 N., R. 109 W. (Sublette County). An existing pipeline would be used to gather condensate on the north end of the Mesa.

The total length of the pipeline would be approximately 107 miles, of which 88 percent is on Federal lands administered by the BLM and Bureau of Reclamation (BOR) (see Table 2-3). Appendix B shows the pipeline route and landownership.

Table 2-3
Landownership for the Condensate Pipeline

	Total	Federal	State	Private
Miles	107.35	87.78	2.12	17.45
Percent	100	82	2	16

The condensate pipeline would consist of API 5Lx52 pipe with a maximum operating pressure of approximately 2,120 pounds per square inch gauge (psig). Questar estimates the condensate pipeline will transport 12,000 to 18,000 barrels per day.

Operating pressure would be generated by electric pumps installed at the existing Pinedale Compressor Station (also know as Gobblers Knob) in the NW of Section 2, T. 32 N., R. 109 W. A 500 x 500 foot expansion of the existing Gobblers Knob facility would be required to accommodate equipment necessary to operate the condensate pipeline.

Liquids would be piped from each of Questar's well pads to the Gobblers Knob Facility. The expanded facility would house a 3-phase separator to separate water, gas and condensate. Water from the 3-phase separator would be piped to on-site water storage tanks or would be pumped into an existing water gathering system. Gas from the 3-phase separator would be metered and sold. Condensate from the 3-phase separator would be pumped down the condensate pipeline by electric-driven pumps, processed and sold. Valve assemblies would be spaced approximately every 20-miles along the condensate pipeline and on each side of river crossings.

If there is an equipment failure or power loss at the expanded facility, gas would be flared. A back-up generator capable of running one pump would be installed.

Workforce Requirements and Construction Schedule. Construction would begin in May 2005 and would proceed from south to north. Questar would notify the authorized officers of the appropriate agencies five days prior to commencing construction activities. Questar would comply with all timing stipulations for wildlife. Easements would be obtained from private landowners. Construction would be complete and the pipeline operational by November 15, 2005.

Questar expects the peak construction workforce to reach approximately 50 workers. The construction workforce would commute daily from surrounding communities in the Rock Springs and Pinedale area.

Design. The design and engineering of the condensate pipeline would be completed by Questar personnel or its contractors in accordance with safe and proven engineering practices. Pipeline plans and specifications, alignment sheets, road profiles, cross sections, site-specific details, and design drawings associated with the project would be provided to BLM field offices in Kemmerer, Pinedale and Rock Springs prior to issuance of the right-of-way grant.

Rights-of-Way and Permits. Questar would secure all rights-of-way and permits necessary for construction prior to commencing construction. Questar is requesting Federal rights-of-way for a period of 30 years with options to renew for as long as there are marketable quantities of condensate available. Questar would conduct all activities associated with construction, operation, maintenance and abandonment of the pipeline within the authorized limits of the right-of-way.

Questar has requested a 30-foot wide operational and maintenance right-of-way. Additional permanent right-of-way for two 150 x 150 foot sites is also requested in the SE of Section 7, T. 23 N., R. 111 W. and in the NE of Section 26, T. 28 N., R. 109 W. These locations would house pig launching and receiving assemblies which are used to periodically remove liquids from the pipeline.

During construction, Questar is requesting temporary use of an additional 20-foot width of construction area for a total 50-foot wide construction right-of-way for the entire length of the pipeline. Additional workspace beyond the 50-foot width would be necessary for temporary work areas at truck turn-arounds and at each road, railroad, river and pipeline crossing. Extra workspace would also be required at deep draws or sidehill cuts for the storage of topsoil and subsoil. The locations of temporary extra work areas are shown on the maps in Appendix B.

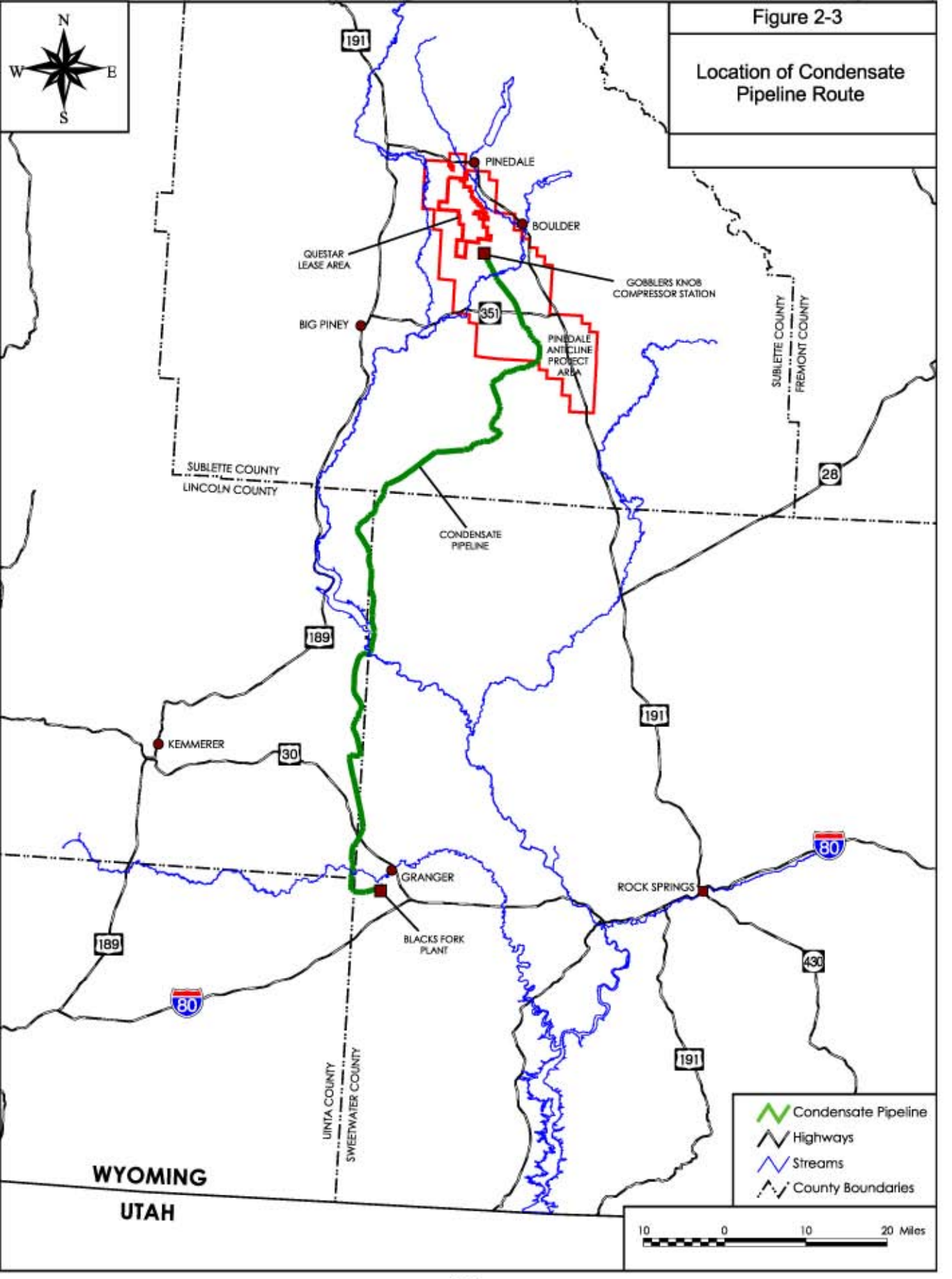
Figure 2-3
Location of Condensate Pipeline Route
N
W
E
S
191
PINEDALE
BOULDER
QUESTAR LEASE AREA
GOBBLERS KNOB COMPRESSOR STATION
351
BIG PINEY
PINEDALE ANTICLINE PROJECT AREA
SUBLETTE COUNTY
FREMONT COUNTY
SUBLETTE COUNTY
LINCOLN COUNTY
28
CONDENSATE PIPELINE
189
191
KEMMERER
30
80
GRANGER
ROCK SPRINGS
BLACKS FORK PLANT
189
430
80
191
UINTA COUNTY
SWEETWATER COUNTY
WYOMING
UTAH
Condensate Pipeline
Highways
Streams
County Boundaries
10
0
10
20 Miles

Table 2-4 Condensate Pipeline Surface Disturbance Summary			
	Size	**Total Construction Disturbance (acres)**	**Permanent Right-of-Way (acres)**
Pipeline	107.35 miles	650.5	390.36
Pig Launchers/Receivers	2 at 150 x 150 feet		1.03
Temporary Staging Areas	See Appendix B Maps	104.57	
Total		**755.07**	**391.39**

Table 2-4 shows the surface disturbance associated with constructing the proposed pipeline. Surface disturbance would occur on undisturbed land as well as previously disturbed land within the proposed condensate pipeline right-of-way. Because the condensate pipeline route is adjacent to or between existing pipelines for most of its alignment, most disturbance will occur in areas previously disturbed during construction of other existing pipelines.

Construction. Construction sites would be maintained in a clean and safe condition at all times and construction waste materials would be disposed of promptly at an approved waste disposal site. Construction activities would not inhibit public use of existing roads and trails, or prevent wildlife or livestock movement.

Clearing and Grading. Prior to the start of construction, the limits of the construction right-of-way would be clearly staked. After staking, the right-of-way would be cleared of vegetation. A motor grader with a blade would be used to remove vegetation, such as sagebrush, within as much of the 50 foot right-of-way as is needed to provide a safe and level working area.

After vegetation clearing, a minimum of 6 inches of topsoil would be stripped from any area that needs to be graded and the ditch line and stockpiled on the non-working side of the construction right-of-way. Topsoil would not be mixed with ditch spoil or other excavated material.

Grading would be conducted as necessary to allow the safe movement of equipment and personnel along the right-of-way. Grading would also be conducted where necessary to reduce the need to bend pipe. Grading usually requires cutting or filling and may include ripping rock close to the surface.

Equipment traffic across/through drainage channels would be limited to sloping drainage sides or to vertical banks of less than two feet. To the extent practicable, drainage crossings would be aligned perpendicular to the stream channel.

Ditching, After grading is complete, a wheel trencher would be used to dig a 2 foot wide trench, stockpiling the dirt beside the ditch. In rocky areas or areas where the pipeline changes direction, a track-hoe would be used. The ditch would be excavated to a minimum depth to allow for 60 inches of cover over the pipeline.

Hauling and Stringing, Once grading is complete, all construction materials would be hauled to construction sites by truck. Pipe would be strung along the right-of-way in a manner as to cause the least interference with the normal use of the land crossed by the right-of-way.

Public Road Crossings. At all public road crossings, the pipeline would be buried to a minimum of 60 inches below the bottom of the borrow ditch. Public road crossing techniques would be determined by the agency responsible for maintaining the road (i.e., BLM, State, county). Roads that are not heavily used would be open cut, backfilled and compacted. Heavily traveled roads would be bored to avoid disrupting traffic. Shoe-flies (detour roads) would be constructed at road crossings to prevent disruption of use.

Bending, Welding, and Coating. A bending machine would be used to bend the pipe to fit the ditch and contour of the land. All welding would be conducted in compliance with American Petroleum Institute (API) Standard 1104, "Welding of Pipelines and Related Facilities." The welds would be X-rayed to insure the quality of the weld. The welded pipe string would be temporarily stored on skids until lowered into the ditch.

Although the pipe would arrive at the right-of-way with a corrosion-resistant coating, additional coating would be applied to the welds and any damaged areas. Cathodic test stations would be installed at all other pipeline crossings, at road bores and approximately every mile along the pipeline. These stations would be used to test and monitor corrosion during operations.

Lowering In, Padding, and Backfilling. Side booms would be used to lower the pipe into the trench. In rocky areas, the trench would be padded with sand or soil using a padding machine, which separates rocks from satisfactory padding materials. After the pipe is placed in the ditch, a motor grader or dozer would be used to backfill the ditch. The fill in the ditch would then be compacted with the grader wheels. Excavated material that cannot be placed in the ditch would be

disposed of in compliance with landowner and agency requirements.

Horizontal Directional Drills (HDD). In areas where it is environmentally-undesirable to use open-cut construction techniques, such as at large river crossings, HDD would be used. Questar specifically proposes to HDD beneath the Blacks Fork, Hams Fork, Green and New Fork rivers to prevent erosion and to minimize any increase in sediment load to the waters.

This construction technique uses drilling equipment to bore and install a pipeline beneath a surface obstruction or environmentally-sensitive area without disturbing the surface area. First, a pilot hole is bored along a pre-determined path under the area of concern. Once the pilot hole has been successfully completed, the pilot hole is enlarged by reaming out the hole in multiple passes with a reamer. After the hole has been enlarged to a diameter large enough to receive the pipe, a pre-tested section of pipe (coated with abrasion resistant coating) is pulled into the bored and reamed hole through a bentonite slurry. This slurry helps to keep the hole open, acts as a slicking agent and also seals the bore annulus. Once the pipe section is pulled through the bored hole, the HDD section would be welded to pipe on both sides of the HDD.

Fabrication/Tie-Ins. Valve assemblies, pig receivers, pig launchers, filters, strainers, side taps, and meter stations would be prefabricated off-site. Tie-in crews would be used to complete the final installation of fabricated assemblies, road crossings, and other congested areas.

Hydrostatic Testing. After the trench is backfilled, the pipeline would be pressure tested with water. The pipeline would be filled with water and pressurized to a minimum of 1.25 times the designated operating pressure for 8 hours to verify integrity. Test water would be obtained from the Hams Fork, Green and New Fork rivers and pumped to the pipeline for testing. Permits or license agreements for the withdrawal would be obtained from the Wyoming State Engineer's Office and the Bureau of Reclamation. Prior to release the test water would be tested and processed, if necessary, to ensure it meets local, State and Federal water quality standards. In order to prevent scouring and erosion, test water would be discharged into energy dissipation devices, filter bags, or straw bale dewatering structures, which would be removed upon completion of testing.

A total of 2.85 acre-feet of water will be necessary for hydrostatic testing. Testing would be performed in six segments with three water source and discharge point locations. These withdraw and discharge points would be located in close proximity to each other. Approximately 0.83 acre-feet would be withdrawn from the Hams Fork River; approximately 1.24 acre-feet from the Green River and approximately 0.78 acre-feet from the New Fork River. The three withdrawal points would be located in the SW of Section 10, T. 19 N., R. 112 W. (Hams Fork River), NW of Section 18, T. 23 N., R. 111 W. (Green River) and SE of Section 11, T. 31 N., R. 109 W. (New Fork River) (see maps in Appendix B).

Hazardous Materials. Questar would comply with all applicable Federal and State laws with respect to hazardous substances. Hazardous waste would not be generated during construction of the pipeline. A release of a hazardous substance, such as a leak or spill, in excess of the reportable quantity as established by 40 CFR Part 117.3, would be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, Section 102 B. No toxic substances are proposed for use in connection with construction; however, if toxic substances are necessary, their usage would comply with provisions of the Toxic Substances Control Act of 1976, as amended (40 CFR Part 702-799).

Appendix C provides a list of the hazardous and extremely hazardous materials, as identified in the Environmental Protection Agency Consolidated List of Chemicals Subject to Reporting under Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 355, that Questar would use during construction of the pipeline. Quantities would be limited to only the amounts needed for construction. Fuels would not be stored on location and would be provided by a vehicle that refuels and services construction equipment. Material Safety Data Sheets would be maintained by Questar for all materials used.

Fire Control. Questar would notify the authorizing officer of any fires during construction and would comply with all rules and regulations administered by the authorizing officer concerning the use, prevention, and suppression of fires on Federal lands. In the event of a fire, Questar or their contractors would initiate fire suppression actions in the work area. Suppression would continue until the fire is out or until the crew is relieved by an authorized representative of the agency on whose land the fire occurred. Heavy equipment would not be used for fire suppression outside the right-of-way without prior approval of the authorizing officer unless there is imminent danger to life or property. Questar or their contractors would be responsible for all costs associated with the suppression of fires and the rehabilitation of fire damage resulting from their operations, employees, or contractors.

Questar would designate a representative to be in charge of fire control during pipeline construction. The fire representative would ensure that each construction crew has fire fighting tools and equipment (such as extinguishers, shovels and axes) available at all times. Questar would, at all times during construction, maintenance, and operations, require that spark arresters be maintained on internal combustion engines.

Reclamation. Initial reclamation would begin following completion of hydrostatic testing. The right-of-way would be restored in accordance with agency/landowner specifications. All disturbed areas would be re-contoured so that the disturbed area is visually consistent with the surrounding terrain. Topsoil would be evenly spread across the right-of-way. Erosion would be prevented by the use of construction diversion terraces, rip-rap, matting and water bars. No berms or mounds would be created over the backfilled trench.

Questar proposes to restore BLM and BOR lands and waters of the United States (including stream and wetland crossings) in accordance with the following stipulations:

- Certified weed-free seed would be used during re-seeding of disturbed areas;
- Native plant species would be used in re-seeding;
- Noxious weed control would be conducted for the life of the pipeline;
- Monitoring for noxious weeds and for the success of vegetation establishment following initial and any subsequent plantings would be conducted;
- All compacted areas would be ripped to the necessary depth to reduce compaction prior to seeding at the request of the BLM and/or BOR;
- Surface disturbance would be minimized during pipeline construction;
- Water breaks would be installed on slopes following BLM and BOR criteria;
- Contour furrows, water bars and/or erosion control blankets would be installed to limit conditions favorable for accelerated erosion at the request of the BLM and/or BOR;
- Channel cross-sections of ephemeral stream channels would be restored to pre-disturbance contours; and
- Ephemeral stream crossings would be monitored to identify and mitigate conditions of accelerated erosion within the pipeline right-of-way. This monitoring would continue until the agencies determine disturbed areas have been stabilized and an adequate percent cover density of native vegetation has been established.

All disturbed areas along the pipeline right-of-way would be seeded to the applicable specifications, including components of the seed mixture, application rate and application technique. Where applicable, seed would be planted using a drill. In unsuitable areas, the seed would be broadcast and raked or chained to ensure sufficient soil cover (broadcast seed rates would be double that of the drilled seed rate).

Operation and Maintenance. Questar would conduct all activities associated with construction, operations, maintenance and abandonment of the right-of-way within the authorized limits of the right-of-way. All permanent aboveground facilities, piping, and valving would be painted a non-contrasting color harmonious with the surrounding landscape (Carlsbad Canyon (2.5Y 6/2) or other visually suitable color specified by the BLM).

The pipeline would be routinely patrolled and inspected by foot or vehicle from roads, the permanent right-of-way and by aircraft to check for problems such as right-of-way conditions, encroachment on the right-of-way, and any other situation that could cause a safety hazard or require preventive maintenance. If damage should occur to the pipe from external sources, repair or replacement of the portion of the pipeline may be necessary.

Questar would be responsible for weed control on the disturbed areas within the established limits of the right-of-way. Questar would coordinate with the authorized officer of the appropriate regulatory authority or local authorities to develop acceptable weed control methods for the disturbed areas within the right-of-way limits. Before using pesticides, including use in emergency situations, Questar would obtain written approval of its plan detailing the type and quantity of material to be used, pests to be controlled, method of application, location of storage, disposal of containers, and any other information deemed necessary by the regulatory agency. If pesticides were required, Questar would comply with all applicable Federal and state laws. Pesticides would be used in accordance with registered uses and within limitations imposed by the appropriate regulatory authority.

Abandonment. Prior to abandonment, Questar would obtain authorization from the appropriate regulatory agency. BLM would determine whether the pipeline and all aboveground pipeline facilities are removed and unsalvageable materials disposed of at approved sites or abandoned in place. Re-grading and revegetation of disturbed land areas would be completed where necessary.

2.5 Applicant-Committed Mitigation

To off-set potential impacts caused by winter drilling, Questar has voluntarily agreed to implement a number of extensive mitigation measures. The impact analysis contained in this EA is based on the assumption that all of these measures will be effectively implemented.

2.5.1 Flareless Completions

Typically during well completion, a significant amount of natural gas is flared. The flared natural gas results in significant, although relatively short-term, emissions of air quality pollutants and is extremely noisy. Questar has begun testing a flareless technology and has proven that flareless completions are possible for PAPA wells. However, given the current timing restrictions for drilling and well completion on Questar's lease area, Questar is forced to complete as many as 30 wells in the last 30 days of every summer. According to Questar, continued seasonal restrictions may result in limited ability to continue utilizing flareless completions for all wells. Questar has committed to the BLM that eliminating the winter drilling seasonal stipulations on their leases will eliminate the need for flaring and its associated noise, visual and air quality impacts.

2.5.2 Sublette County Mule Deer Study Phase II

In consultation with the BLM and WGFD, Questar would fund an expanded mule deer study. Although the scope of this expanded study has not been determined, the first phase of the study provided very important information to wildlife biologists and managers. Winter drilling from 3 well pads each year for 9 years in the Questar leasehold will allow biologists to expand the scope of the study and provide more definitive information regarding impacts of winter drilling on mule deer.

2.5.3 Habitat Enhancement

In consultation with BLM and WGFD, Questar has volunteered to develop a mitigation program for wildlife habitat improvement in non-producing areas of their leasehold. Specifically, Questar has agreed to complete 3 acres of habitat improvement for every one acre of habitat disturbance associated with future development in their lease area. According to the WGFD (see Appendix A), the program "would decrease the impacts of habitat disruption by drill pads and roads by improving adjacent habitat for displaced animals." Vegetation improvement would begin immediately, thus reducing the lag time between the beneficial effects and adverse impacts.

2.5.4 Consultation with BLM and WGFD

Questar has agreed to consult with BLM and WGFD regarding siting of future well pads for purposes of avoiding sage grouse leks or other identified key habitat areas or features.

2.5.5 Condensate Pipeline

Part of Questar's Proposed Action is to construct the condensate pipeline. The environmental benefits of the condensate pipeline and the previously-approved water gathering pipeline system are noteworthy. Along with gas, wells in the PAPA produce water and condensate. Currently, these liquids are separated from gas at the wellhead and stored in on-site tanks. Once the on-site tanks are full, the liquids are removed using tanker trucks. Once their acreage is completely developed, Questar estimates that 25,000 annual tanker truck trips will be required to remove produced water and condensate from the well pads at peak production.

The condensate pipeline and water gathering system would eliminate the need for future tanker truck traffic within Questar's leasehold. The benefits of reducing truck traffic will be realized through reduced congestion, noise, emissions and dust and should reduce direct mortality to wildlife. The pipelines will also allow the removal of condensate and storage tanks from well pads.

2.5.6 Telemetry

To minimize operation traffic on their leases, Questar proposes to install telemetry equipment on operating well pads. Using telemetry equipment, Questar will be capable of monitoring and controlling wells via radio signals which will reduce the number of visits by well operators.

2.5.7 Emission Reduction

To reduce emission in the PAPA, Questar has agreed to implement EPA Tier II compliant or alternate fuel engines for drilling rigs by 2007.

2.6 Alternatives

Based on public scoping and on comments received from other regulatory agencies, BLM developed a number of alternatives to Questar's Proposed Action. Impacts of three alternatives are addressed in detail in Chapter 4 of this EA. Other alternatives were considered but not analyzed in detail for the reasons listed in Section 2.6.2.

2.6.1 Alternatives Considered in Detail

No Action Alternative. In accordance with Council on Environmental Quality regulations, the No Action Alternative is evaluated to provide a base from which to compare impacts associated with the Proposed Action and Alternatives A and B. If the No Action Alternative were implemented, the winter drilling stipulation would not be modified and/or BLM would deny Questar's application to construct the condensate pipeline. In essence, the PAPA ROD would remain unchanged. The applicant-committed mitigation (described in Section 2.5, above) would not be implemented.

Alternative A. Alternative A has the same project components as the Proposed Action, however, the winter drilling seasonal stipulation modification would not begin until the winter of 2005-2006 (one year later than the Proposed Action). Under this Alternative, Questar would be allowed to have a single active well pad with up to 2 drilling rigs within MA 5 during the winter of 2004-2005 and all the applicant-committed mitigation listed in Section 2.5 would be completed and operational prior to November 15, 2005.

This alternative would not affect the proposed condensate pipeline. The condensate pipeline is not expected to become operational until November, 2005. Essentially, this alternative would require the condensate pipeline to be operational before there are impacts from winter drilling at more than one well pad within Questar's lease area.

Alternative B. Under Alternative B, there would be no modification to the winter drilling stipulation. Questar would not be allowed to drill year-round. The exception to the winter drilling stipulation that was granted in the 2001-2002 and 2002-2003 winter seasons would not be continued.

Questar would be required to implement the following mitigation measures under this alternative:

- Install the condensate pipeline;
- Utilize flareless completions;
- Continue Phase 2 mule deer research;
- Use closed drilling systems;
- Cone all heat sources;
- Complete off-site wildlife mitigation;
- Comply with a 500 foot no surface occupancy stipulation in riparian areas;
- Install hospital grade mufflers on drilling rig engines;
- Complete lighting mitigation (point lights inward and down, use colored lights); and
- Use remote telemetry at all existing and new wells.

2.6.2 Alternatives Considered but not Analyzed in Detail

Alternative 1. This alternative includes all project components of the Proposed Action but would allocate year-round drilling pads to each of four operators in MA 2, 4, 5 and 6. This alternative would allow Questar to winter drill from 3 well pads with one each allocated to Anschutz, Shell and Ultra. This pad allocation is based on the number of rigs each operator currently has operating in these MAs. BLM has determined that this alternative is beyond the scope of the EA because the EA will only analyze Questar's lease area and not those of other operators. In addition, BLM has not received specific proposals or applications from other PAPA operators to conduct winter drilling. Consequently, it is not possible to analyze specific resource impacts.

Alternative 2. This alternative includes all project components of the Proposed Action but would not allow new disturbance (well pads) until existing pads are drilled out. BLM has determined that it is not necessary to analyze this alternative in detail because Questar has already committed to coordinating siting of all new and winter drilling pads with BLM and WGFD. Therefore BLM, in consultation with WGFD, already has the ability to select only existing pads for winter drilling.

Alternative 3. This alternative includes all project components of the Proposed Action but would allow no development in big game migration routes. BLM has determined that it is not necessary to analyze this alternative in detail because Questar has already committed to allowing BLM and WGFD to identify the locations of winter drilling pads. Therefore BLM, in consultation with WGFD, already has the ability to select only pads located outside big game migration routes.

Alternative 4. This alternative includes all project components of the Proposed Action but would prohibit drilling in sage grouse breeding and nesting habitat and deer crucial winter range during periods specified in the PAPA ROD. BLM has determined that this alternative is essentially the same as Alternative B, which is being considered in detail.

Alternative 5. During scoping it was suggested that BLM analyze winter drilling throughout the PAPA instead of just for Questar's lease area. BLM has not received applications or proposals from PAPA operators other than Questar. Consequently, BLM has no specific field-wide proposals for analysis.

CHAPTER THREE
AFFECTED ENVIRONMENT

3.1 Introduction

This chapter provides a description of the human and natural environmental resources that could be affected by the two components of Questar's proposal. This chapter does not repeat information contained in the PAPA EIS. The affected environment description in the PAPA EIS for activities proposed within Questar's lease area is relevant to Questar's proposal to conduct year-round drilling for all resources except wildlife. Because the condensate pipeline was not considered in the PAPA EIS, the affected environment is fully described for that project component.

3.1.1 Year-Round Drilling

Since the ROD was issued in 2000, natural gas development on the PAPA has progressed and disturbance has occurred – particularly along the crest of the Anticline. Surface disturbances by roads and well pads on the Mesa have been measured by digitizing disturbance footprints from satellite imagery by Western EcoSystems Technology, Inc. and reported by Sawyer, 2004. In 2000, there were 11.4 miles of roads and 41 acres of road disturbance. Well pad disturbance in 2000 was estimated to be 39 acres. By 2003, a total of 56.5 miles of roads were present resulting in 206 acres of disturbance. Total well pad disturbance in 2003 was estimated at 590 acres on the Mesa. Total natural gas development disturbance in 2003 had affected 796 acres on the Mesa (Sawyer, 2004).

3.1.2 Condensate Pipeline

The condensate pipeline represents a source of additional impact (beyond what occurred during construction of the gas sales pipeline analyzed in the PAPA EIS) and all resources potentially impacted by construction and operation of the proposed pipeline are included in this chapter. The discussion of resources potentially affected by the condensate pipeline draws upon information compiled in the following Resource Management Plans (RMPs) and analyses that have been completed for planning areas and specific projects that would be crossed or parallel the proposed pipeline:

- Green River Resource Area RMP (BLM, 1996);
- Kemmerer Resource Area RMP and EIS (BLM, 1985);
- Pinedale Resource Area RMP and EIS (BLM, 1988);
- Bird Canyon-Opal Pipeline, Granger Spur Pipelines, and One Compressor Station EA (BLM, 1999b);
- Rendezvous Phase IV Pipeline Project EA (BLM, 2003a);
- Luman to Bird Loop Natural Gas Pipeline EA (BLM, 2002);
- Stages II and III of the 20-inch Rendezvous Pipeline between the Mesa and Bird Canyon Compressor EA (BLM, 2004a); and
- Paradise 20/24-inch Pipeline from the Paradise Compressor Site to Bird Canyon Compressor Site EA (BLM, 2004b).

The five EAs listed above analyze the impacts of constructing a pipeline within and adjacent to the proposed condensate pipeline right-of-way.

3.2 Socioeconomics and Environmental Justice

Socioeconomic conditions in counties and communities adjacent to the PAPA are described in the PAPA EIS in Section 3.5. However, the condensate pipeline extends beyond the area described in the PAPA EIS. The proposed pipeline route is located primarily in Sweetwater, Lincoln and Sublette counties (see Figure 2-3). Uinta County is not addressed in this EA as the proposed pipeline crosses only about 2 miles of the county along the county's border with Sweetwater County. The cities and communities in closest proximity to the proposed pipeline are Rock Springs (Sweetwater County), Green River (Sweetwater County), Granger (Sweetwater County), Kemmerer (Lincoln), and La Barge (Lincoln).

The counties are primarily rural and their economies are tied to traditional natural resource-based industries. Agriculture provided the basis for community development during the nineteenth century; however, its importance has recently diminished. Mineral extraction industries, particularly oil and gas, now provide much of the area's economic base.

3.2.1 Demographics

Recent population trends in counties crossed by the proposed pipeline are shown in Table 3-1. Populations in the counties peaked in the mid-1980s and gradually declined thereafter. The populations of Sublette and Lincoln counties remained fairly level during the 1990s. However, Sweetwater County has

Table 3-1 Sweetwater, Lincoln and Sublette Counties Population Statistics				
Region	**1990**	**2000**	**Population Change**	**Annual Percent Change**
Wyoming	453,588	493,782	40,194	0.9
Sweetwater County	38,823	37,613	-1,210	-0.3
Lincoln County	12,625	14,573	1,948	1.4
Sublette County	4,843	5,920	1,077	2.0
Source: Real Estate Center at Texas A&M University 2002, a, b, c and d and ER. Sys.com, 2001				

shown a net loss in population each year since 1993. The reasons for the changes in population growth/decline were probably related to the level of activity associated with the oil and gas industry (University of Wyoming, 2003). Statistics maintained by the U.S. Census Bureau indicate that while the birth rate to death rate ratio is relatively constant, increasing numbers of residents are migrating out of the county. Rock Springs, the most populous city in Sweetwater County, displays even greater population decline than the county as a whole. Recent statistics for the years 2000 and 2001 indicate that Sweetwater County continued to lose population at a rate of approximately 2 percent over the 3-month period from April to July, 2001 (U.S. Census Bureau, 2003a). Lincoln and Sublette counties, however, show population growth over the same period, at 1.5 percent and 1.7 percent, respectively (U.S. Census Bureau, 2003b and 2003c).

3.2.2 Economic Activity

Wyoming's economy reached the bottom of an economic "bust" in 1987 and started to recover thereafter. The recovery began to slow in 1996. The State economic forecast is for slow growth through 2008 (Wyoming Department of Administration and Information, 2000).

The primary revenue-producing industries in Sweetwater, Lincoln and Sublette counties are mining (including oil and gas), government, transportation and manufacturing. The mining industry accounted for approximately 40 percent of total earnings in the first part of the decade (1990-2000); however, that percentage declined to approximately 32 percent by 1999. Farming and agricultural services declined by 25 percent over the decade, and transportation and utilities declined by 3 percent. However, manufacturing revenues displayed growth during this period to account for over 10 percent of total revenues generated (BLM, 2003b).

Mineral property is the major component (93 percent) of property assessed by the State, and minerals production is the major source of tax revenues for the government. Oil and gas production comprised 82 percent of all mineral valuation in the 3-county area in 2001. Of all property and production assessed by State and local governments, oil and gas operations accounted for 67 percent of assessed value in 2001. Tax revenues from mineral production were approximately $114 million in 2001. Approximately 91 percent was derived from oil and gas. Oil and gas in the 3 counties accounted for 63 percent of the property taxes generated for fiscal year 2001. Natural gas production generated the greatest portion of severance tax revenues for the counties (approximately 73 percent).

3.2.3 Employment

Total employment in the 3-county area grew 12 percent from 1990 through 1999, lagging behind a 20.4 percent growth State-wide. The primary economic activities generating employment in Sweetwater, Lincoln and Sublette counties are retail trade, services, government and mining (including oil and gas operations). Mining employment declined over this time while other employment sectors grew. Despite the decline, approximately 13 percent of the labor force in the 3-county area was employed in natural resource extraction. The counties also showed a slightly higher level of employment associated with farming and farm services (4.4 percent) than the State as a whole (3.8 percent) (BLM, 2003b). Employment figures for the second quarter of 2000 indicated that Sublette County had a significant gain in jobs, but Sweetwater and Lincoln counties fell approximately 2.6 percent as a result of job losses in the mining, construction, transportation and public utilities sectors (Bullard, 2001).

Unemployment in Sweetwater and Lincoln counties was approximately 5 and 6 percent in 2000, respectively, somewhat higher than the State-wide unemployment rate of approximately 2.5 percent. Sublette County, however, fell below the state-wide figure (BLM, 2003b).

3.2.4 Environmental Justice

Federal agencies are required to conduct their programs, policies and activities that substantially affect human health or the environment in a way that ensures that no person is excluded from participation therein, denied the benefit of, or subjected to discrimination due to race, color or national origin. Executive Order 12898 requires Federal agencies to assess their projects to ensure they do not result in disproportionately high and adverse environmental,

health or safety effects to minority or low-income populations.

Sweetwater County is approximately 92 percent white while Lincoln and Sublette counties are greater than 97 percent white. Each county contains very small populations of Native Americans, Hispanics and other minorities (U.S. Census Bureau, 2003b, c and d).

3.3 Transportation

3.3.1 Year-Round Drilling

Concomitant with natural gas development, vehicle traffic through or adjacent to the PAPA has increased since 2000. For example, daily traffic volume on State Highway 351 was estimated at 640 vehicles/24 hours (with 110 trucks/24 hours) in 2000. By 2003, traffic volume on the same highway had nearly doubled to 1,200 vehicles/24 hours while truck traffic more than doubled to 290 trucks/24 hours (Wyoming Department of Transportation - WDOT, 2004. Unpublished data). Likewise, traffic on U.S. Highway 191, measured in the vicinity of the junction with Wenz Airport Road (milepost 92.8), increased from 1,700 vehicles/24 hours (180 trucks/24 hours) in 2000 to 2,595 vehicles/24 hours (290 trucks/24 hours) in 2003 (WDOT, 2004).

Comparable traffic volume data is not available for well field roads within the PAPA. But, traffic on the PAPA was measured during May and June, 1999; averages of 12 cars/day on the Mesa Road (see Figure 2-2) and 9 cars/day on the Anticline Crest Road (both of which are within Questar's lease area) were reported by Inglefinger (2001) and indicate a very low volume prior to development. Beginning in 2001, one year after the PAPA ROD, Matt Holloran, graduate student at the University of Wyoming, measured traffic on the Mesa Road during the period from March 15 to May 15. In 2001, average traffic volume was approximately 113 axles/day (57 vehicles/day if all had 2 axles, 38 vehicles/day if all had 3 axles). In 2002, volume on the Mesa Road dropped to 22 axles/day because most well field traffic to the Mesa was rerouted to the newly constructed extension of the Anticline Crest Road and remained at that low level through 2004 (Holloran, 2004. Unpublished data). That measure of traffic volume is similar to the predevelopment volume in May-June 1999.

On the Jonah North Road that connects State Highway 351 to the Boulder South Road (also within the PAPA) Holloran recorded the following average volumes from mid-March through mid-May: 59 axles/day in 2001, 73 axles/day in 2002, 125 axles/day in 2003, and 257 axles/day in 2004. That data suggest that traffic volume on the Jonah North Road has been increasing exponentially since 2001. No traffic data within the PAPA have been recorded during winters in any year.

3.3.2 Condensate Pipeline

A regional network of State highways and county, local and rural roads provides the basic transportation infrastructure for access to the pipeline route. Interstate 80 is near the southern terminus of the proposed pipeline and is the main east-west travel corridor across the State.

U.S. Highway 30 extends from Granger northwest to Kemmerer. The proposed pipeline route crosses U.S. Highway 30 just north of the crossing of the Hams Fork River. State Highway 372 extends from Green River to Fontenelle, crossing the pipeline route south of Fontenelle Reservoir. State Highway 351 extends from U.S. Highway 191 west to an intersection with U.S. Highway 189 near Marbleton and Big Piney. The proposed pipeline route crosses State Highway 351 just south of the New Fork River crossing. There are no State highways that parallel the pipeline route for its length (see Figure 2-3).

Roads in rural areas crossed by the pipeline route are typically characterized by low traffic volumes, infrequent congestion, high travel speeds and rugged terrain. Common attributes of rural roads include a mix of rural and urban travelers, secondary roads with less frequent maintenance, large variances in travel speeds and frequent passing, adverse road surface conditions, light usage, and large geographical areas that impede rapid emergency detection and response (Goehring and Sundeen, 1999).

3.4 Land Use and Grazing

Land use and grazing resources in the PAPA are described in Sections 3.7 and 3.17, respectively. Where development activity has been concentrated along the Anticline crest, oil and gas development is now the principal land use in the PAPA.

The condensate pipeline route in Sublette, Sweetwater, Lincoln and Uinta counties passes through an area that is primarily rural and tied to traditional natural resource-based industries. Agricultural and mineral extraction industries, particularly oil and gas, are principal land uses. Areas in Sweetwater County crossed by the pipeline are zoned agricultural with some areas of minerals development, except part of the route within the city limits of Granger.

Urban development is focused in specific locations near the proposed pipeline, primarily in the

communities of Granger near the southern terminus of the proposed pipeline as well as La Barge west of the mid-point of the pipeline, and Pinedale north of the pipeline's northern terminus. Green River and Rock Springs to the east and Kemmerer to the west are the larger communities located near the proposed pipeline.

Grazing is the primary agricultural use of the lands in the vicinity of the proposed pipeline and in the PAPA away from the crest of the Anticline. Arid conditions and relatively unproductive soils preclude extensive crop development. There are no irrigated croplands in the area near the pipeline route (Wyoming Water Resources Center, 2002).

The proposed pipeline route will cross portions of 13 grazing allotments (Table 3-2). Most allotments are designated for use by sheep and cattle, or cattle only. Season of use varies considerably between allotments.

3.5 Recreation Resources

Recreation opportunities in and adjacent to the PAPA are described in the PAPA EIS in Section 3.8. BLM lands crossed by the proposed condensate pipeline support dispersed recreation for hiking, camping, mountain biking, fishing, river running, sight-seeing, wildlife watching, and hang gliding (Sweetwater County Joint Travel & Tourism Board, 2002).

Fontenelle Reservoir is located on the Green River 24 miles southeast of La Barge, approximately 0.5 mile west of the proposed pipeline route at its closest point. Recreation use is low and seasonal. Local recreational fisheries include rainbow, brown and cutthroat trout. Stream fishing opportunities exist on the Green River above and below the reservoir (Sweetwater County Joint Travel & Tourism Board, 2002). Fontenelle Creek Campground has developed campsites with restrooms and running water but is 8 miles from the pipeline route. Three other campsites are located approximately 2 miles west of the route below the dam and are more primitive.

Seedskadee National Wildlife Refuge is located approximately 0.5 mile east of the condensate pipeline route along the Green River. It consists of 26,300 acres of river habitat in a 35-mile square area, features more than 200 species of birds, and is a breeding ground for bald eagles, Canada geese, mallards and trumpeter swans. Hunters pursue numerous game species on the Refuge, including antelope, mule deer, sage grouse and waterfowl. The Green River also offers world-class trout fishing opportunities for anglers year-round (Sweetwater County Joint Travel & Tourism Board, 2002).

The network of historic trails in the area provides a unique recreational and historic experience for mountain bikers. The Oregon Trail, California Trail, Pony Express Trial, Mormon National Historic Trail, and the Overland Stage Route are all suited to mountain biking.

3.6 Visual Resources

Throughout development of the PAPA, BLM has been able to maintain visual resource protection in MAs 2 and 4 consistent with the limitations incorporated into the PAPA ROD. No wells have been allowed in MA 2 (the Breaks) and BLM has maintained well pad densities within limits established in the ROD in MA 4 (see Chapter 2 of this EA). However, along the Anticline crest the viewshed has changed dramatically and is now dominated by oil and gas development including well pads, drilling rigs, roads and gathering pipeline disturbances and production facilities.

The proposed pipeline route crosses three Visual Resource Management (VRM) sensitivity classes (Classes II, III, and IV) parallel and adjacent to multiple pipeline rights-of-way that connect the Rocky Mountain Pipeline Facility with the pipeline's terminus at Gobblers Knob. The proposed pipeline parallels, is adjacent to, or overlaps an existing right-of-way of another pipeline for most of the proposed length.

The objectives of the three VRM classes crossed by the pipeline are as follows:

- Class II: The objective is to retain the existing character of the landscape. Management activities may be seen, but should not attract the attention of the casual observer;
- Class III: The objective is to partially retain the existing character of the landscape. Activities may draw the attention of the casual observer, but should not dominate the landscape; and
- Class IV: The objective is to provide for management activities requiring major modifications of the existing character of the landscape. The level of change to the landscape can be high and management activities may dominate the view; however, the change should repeat the basic elements of form, line, color and texture of the surrounding landscape.

VRM Class II areas that would be crossed by the proposed pipeline are associated with the Hams Fork River, Green River and New Fork River and their associated valleys/floodplains, and adjacent uplands on both sides of the river crossings.

Table 3-2 Grazing Allotments Potentially Affected by the Proposed Condensate Pipeline			
Allotment	**Allotment Area (acres)**	**Livestock Type**	**Season of Use**
Figure Four	114,425	Sheep/cattle	5/10-1/10
Eighteen Mile	228,840	Sheep/cattle	5/1-1/31
Lombard	94,802	Sheep/cattle	5/1-1/31
Seedskadee	12,555	Horse	All year
		Sheep/cattle	5/1-12/31
Slate Creek	267,048	Sheep/cattle	4/15-11/30
Granger Lease	467,059	Sheep/cattle	Dec-Apr/May-Oct
Mount Airy	9,732	Cattle	5/16-6/25
Mesa Common	55,789	Cattle/horses	5/16-6/25 10/1-11/15
New Fork Ind.	1,850	Cattle	5/10-6/20
Blue Rim Ind.	36,585	Cattle	5/10-6/23
Sand Draw	31,740	Cattle	5/1-6/26
Blue Rim Desert	39,609	Cattle	5/1-6/21
South Desert	34,564	Cattle	5/1-8/23
Total	1,394,598		
Source: BLM, 2003a and Jackson, 2004			

VRM Class III areas are located: 1) north/northeast and immediately adjacent to the VRM Class II area along the Hams Fork River; 2) south/southwest and immediately adjacent to the Class II area along the Green River; and 3) both north and south of the Class II area along the New Fork River.

VRM Class IV areas occupy the remainder of lands crossed by the proposed pipeline, including the Blacks Fork River crossing (BLM, 1999b).

3.7 Cultural and Historic Resources

Cultural and historic resources in the PAPA are described in the PAPA EIS in Section 3.10. This section describes cultural resources along the condensate pipeline.

3.7.1 Cultural History Overview

Cultural resources in the area of the proposed pipeline consist of sites associated with prehistoric and historic time periods. The prehistoric period extends from approximately 12,000 years before present time (B.P.) through 350 B.P., when European cultural items began to arrive in the Green River Basin. Approximately 75 percent of the sites found in the Green River Basin are prehistoric. Artifacts from prehistoric times include projectile points, grinding slabs, pottery and evidence of camp sites (BLM, 1996).

Many historic sites in the Green River Basin are associated with historic trails. The Upper Green River Basin provided routes over the Continental Divide and over the major rivers of the region. Trails provided a route through the arid region on the way to moister lands to the west and nearer the coast (BLM, 2003c). Several historic trails will be crossed by the proposed condensate pipeline including the Oregon-California-Mormon-Pony Express Trails and the Lander, Sublette, Kinney (East Bank Kinney), and Slate Creek Cutoffs of the Oregon Trail. The Oregon Trail is listed in the National Register of Historic Places (NRHP) (BLM, 1999b). The Kinney, Slate Creek, Sublette and Lander Cutoffs were variants of the Oregon Trail, each crossing the Green River at a different location. The routes rejoined to the west before reaching the Bear River and the main route of the Oregon Trail (BLM, 2003c). Other historic sites in the Green River Basin are associated with the early fur trade, the frontier military, railroads, the mining industry, ranching, and early oil and gas development (BLM, 1996).

3.7.2 Cultural Resource Inventory Results

Class III inventories for much of the proposed pipeline right-of-way were completed in association with the installation of existing adjacent pipelines. These inventories resulted in the testing and documentation of previously known sites, the recording and evaluation of previously unknown sites, and the identification of isolated finds.

Additional field work conducted for the proposed pipeline included:

- A Class III cultural resource inventory of the right-of-way including staging areas; and
- Testing for eligibility for nomination to the NRHP.

Based on previous and the current Class III inventories, approximately 161 sites (142 previously recorded and 19 newly identified) are documented within the proposed pipeline right-of-way. Thirty five of the sites are recommended eligible and 125 sites are recommended not eligible for nomination to the NRHP. One site was not found - its status is unknown and it is presumed destroyed. The proposed pipeline crosses portions of the eligible sites that do not contribute to their eligible status.

3.7.3 Traditional Cultural Properties

Native American tribes, including the Ute, Arapahoe, Cheyenne, Shoshone and Shoshone-Bannock, have been identified with tribal territories located in the general area of the pipeline route. Outreach with potentially affected Native American Tribes was conducted for the condensate pipeline. No Native American religious concerns were identified.

3.8 Minerals, Geology and Geologic Hazards

Geologic resources, minerals and geologic hazards in the PAPA are described in the PAPA EIS in Section 3.12. This section focuses on geologic conditions along the proposed condensate pipeline route.

The proposed pipeline is located within the Green River Basin, primarily a flat to gently rolling plain along the pipeline route. Slopes along the route are rated between 7 and 10 by the Natural Resource Conservation Service (NRCS), indicating slopes that are generally less than 5 percent with limited areas displaying slopes of 5 to greater than 10 percent (Hamerlinck and Arneson, 2002).

Exposures of the Eocene-age Bridger Formation comprise most of the surface crossed by the pipeline route from the Blacks Fork Plant area north to the Green River (BLM, 1999b). The Bridger Formation is composed of olive-drab and white sandstones, claystones and conglomerates (Langeson and Spearing, 1988), eroding into rugged badlands with small sand dune and terrace gravel inclusions. Windblown sand deposits in the vicinity of the proposed pipeline have been mostly stabilized with vegetation.

The topography of the central part of the proposed pipeline route between the Green River and approximately the boundary between T. 28 N. and T. 29 N. consists of a broad upland plateau on the lake-deposited, fine grained oil shale and mudstone of the Laney member of the Eocene Green River Formation. Green River Formation bluffs surround nearby Fontenelle Reservoir.

North of the Green River Formation, the surface geology is dominated by exposures of the Eocene Wasatch Formation. The rocks of the Wasatch Formation crossed by the proposed pipeline route consist of locally conglomeratic, brown, green and gray sandstone interbedded with siltstone, mudstone and shale.

In places along the proposed pipeline route, such as along river drainages and atop terraces and buttes, rocks of the Wasatch and Green River formations are overlain by much younger unconsolidated sediments of Quaternary age. These sediments include alluvium, colluvium, stream terrace gravels and wind-blown sands that are late Pleistocene to Holocene (Recent) in age. Some of these deposits may be pre-Wisconsin in age.

Lands crossed by the proposed pipeline do not show evidence of major landslides (BLM, 1999b). There are no known active faults along the pipeline route (Wyoming State Geological Survey *et al*., 2000). There have been no major earthquakes recorded in historic times in the vicinity of the proposed pipeline, although the U.S. Geologic Survey (USGS) estimated that a 4.2 to 4.5 magnitude earthquake might occur somewhere in the Green River Basin every 62 years (BLM, 1999b). On February 3, 1995, a magnitude 5.4 earthquake occurred near Rock Springs which is approximately 33 miles east of the proposed pipeline.

Although hydrocarbon production began early in the 1920s, most of the development occurred in the 1970s and 1980s and continues today. About 6,000 billion cubic feet (bcf) of gas has been produced from Cretaceous beds in the greater Green River Basin, while only 1,600 bcf has come from all other formations combined. The basin contains more than 100 fields with more than one million barrels of condensate.

Salable minerals include sand, gravel, topsoil, boulders, riprap, sandstone, shale, limestone, and borrow material. Sand, gravel and fill material are used by WDOT, other agencies and local contractors. Gravel deposits occur near the Blacks Fork, Hams Fork, Green and New Fork rivers (BLM, 1996). There are no sources of salable minerals within the proposed pipeline route.

Although mining claims and mine shafts exist throughout the basin, there are no claims or shafts along the route of the proposed pipeline.

3.9 Paleontology

The condensate pipeline route crosses the Bridger, Green River and Wasatch formations which are recognized for the presence of significant fossil

remains (Dames & Moore, 1992 and EVG, 1999). During the Eocene, this region was located at much the same latitude it is today, but the climate was moist temperate or sub-tropical. A series of large inland lakes extended across the region, and it is in the bottoms of these lakes that various plants and animals were buried and fossilized. The 3 formations have yielded fossil resources of vertebrates, invertebrates, trace fossils and plants (EVG, 2002a).

Vertebrate fossils in the Green River and Wasatch formations include fish, reptiles, birds and mammals. Invertebrate fossils are abundant, with remnants of snails and insects being common. Plant fossils, including many reeds, leaves and wood specimens, are also prevalent. A large majority of known fossils are fragmentary but some complete skeletons exist of fish, birds, reptiles and mammals.

The Bridger Formation has been explored for paleontological resources since the late 1800s and is known for the presence of land mammals. The Bridger Formation is important because of its abundance of early primate fossils. Turtles were also an important part of the fossil fauna of the formation.

Literature reviews and preconstruction field and open trench monitoring of nearby pipelines between the Bird Canyon Compressor Station and the Granger Gas Plant have been conducted on several occasions since 1998 (EVG, 1999, 2001a, 2001b, 2002a, and 2002b). These reports have confirmed the presence of vertebrate fossils in the surface lithology.

The Bridger, Green River and Wasatch formations are rated as having the highest paleontological potential and meet the BLM's Paleontology Condition 1 and Probable Fossil Yield Classification 5. The unnamed deposits of Quaternary age are not known to yield scientifically significant fossils in the project area. Similar age deposits, however, have yielded scientifically-significant fossils elsewhere in Wyoming.

3.10 Water Resources

3.10.1 Surface Water

Section 4.14 of the PAPA EIS describes water resources in the PAPA. The major hydrologic sub-basins crossed by the proposed condensate pipeline route are the Blacks Fork Sub-basin (HUC14040107), the Slate Creek Sub-basin (HUC14040107) and the New Fork Sub-basin (HUC14040102) (WDEQ, 2004).

The Blacks Fork Sub-basin includes the Hams Fork and Blacks Fork rivers. Both rivers have a designated use classification of Class 2AB by WDEQ, meaning that the waters are protected for drinking water, game and non-game fish, fish consumption, other aquatic life, recreation, wildlife, agriculture, industry, and scenic value. Both rivers are included on Wyoming's Section 303(d) 2004 list of impaired waters. The Hams Fork River near Diamondville is on the 303(d) list due to high pH. The State is conducting further monitoring to better understand the factors leading to high pH, and whether or not they are natural or are attributed to human activities. The Blacks Fork River, from its confluence with the Hams Fork River upstream to an undetermined point above the Smiths Fork, is on the 303(d) list for impairment of contact recreation uses due to exceedences of fecal coliform bacteria. The source of contamination is unknown at this time (WDEQ, 2004).

The New Fork Sub-basin contains the New Fork River. The New Fork River has also been designated Class 2AB. Water quality is reported as good in most of the upper watersheds, however full use attainment monitoring has not been conducted by the State. The portion of the Green River crossed by the proposed pipeline is part of the Slate Creek Sub-basin.

Other surface water resources in the vicinity of the pipeline include intermittent, ephemeral and perennial streams; livestock ponds; seeps; springs and floodplains for the Blacks Fork, Hams Fork, Green and New Fork rivers (BLM, 1999b). Stream channel stability varies from fair to poor.

3.10.2 Ground Water

Ground water beneath the proposed pipeline route is relatively deep in Cretaceous-aged sandstones and shales. Ground water in the southernmost section of the proposed pipeline route (southernmost 15 miles) can be within 20 to 50 feet of the surface. Ground water along the remainder of the route ranges from 50 to 200 feet below the surface. Shallow ground water can be found in the Quaternary sand deposits throughout the northern part of Sweetwater County. Along the Blacks Fork, Hams Fork, Green and New Fork rivers, shallow ground water is found in the mixed soils and terraces in the alluvial basins. Ground water vulnerability to environmental contaminants is low to medium except along the river drainages (Hamerlinck and Arneson, 1998).

Water wells have been drilled in the vicinity of the proposed pipeline, primarily in the area surrounding Granger. Approximately 14 percent of the wells drilled in Sweetwater County are used for domestic purposes. Most of the county's drinking water wells are drilled into alluvial aquifers bounding Bitter Creek between the cities of Green River and Rock Springs, east of the southern terminus of the proposed pipeline. The average well depth in Sweetwater County is 385 feet (Hamerlinck and Arneson, 1998).

Ground water in the Green River Basin is used for agricultural use, municipal and domestic use and industrial use (State West Resources Corp., 2001).

3.11 Soils

Soils in the PAPA are described in Section 3.15 of the PAPA EIS. Soils along the proposed condensate pipeline route are described below.

Soils in Wyoming are closely related to geologic parent materials and vegetation communities (Munn and Arneson, 1998). The Bridger Formation, the Laney member of the Green River Formation, and the Wasatch Formation dominate the surface rock.

In upland areas, these mostly high-clay-content parent materials produced a complex of aridic soils, or Aridisols, that characterize the area. The majority of the upland soils crossed by the proposed pipeline route range from very shallow to moderately deep to deep, forming on rolling upland plains dissected by rock ravines, short escarpments and draws (BLM, 1999b and 1996). Slopes range from nearly level to steeply sloping.

Sensitive upland soils include shallow soils occupying steeper slopes and areas of rock outcrop. These soils typically have high water runoff rates and are subject to accelerated rates of soil erosion, especially when disturbed. The high runoff rates limit the effective moisture received by these soils and their mostly shallow depth limits their water holding capacity, causing them to be droughty which limits their reclamation potential.

Less sensitive upland soils include shallow, to moderately deep, to deep soils that occupy less steep topography. These less sensitive soils are more dominant along the proposed pipeline route, but the shallow soil depths may still limit successful reclamation should recent drought conditions continue in the Green River Basin of Wyoming.

Along the proposed pipeline route, several areas of limited extent occur which are characterized by soils forming in deep sand dunes intermingled with moderately deep to very shallow, well drained, strongly alkaline soils formed on rolling upland plains and fans. Included in this unit are some areas of badlands (BLM, 1992). The sandy texture of the dunes cause potential accelerated soil loss due to wind and reduced moisture holding capacity, and the alkalinity of the adjacent soils limit reclamation potential for these soil types.

Bottomlands associated with drainage bottoms crossed by the proposed pipeline route are floodplains, terraces, and tributary alluvial fans of the Blacks Fork, Hams Fork, Green, and New Fork rivers and the numerous intermittent drainages crossed throughout the proposed route. The bottomland soils of the river drainages are forming in mostly alluvial deposits, vary in texture, are deep, and are subject flooding. These soils typically have a high reclamation potential.

Soils along the floodplains of the intermittent drainages are likely to be saline and can be sodic, affected by high concentrations of sodium in proportion to concentrations of calcium and magnesium in the soil (BLM, 1999b). These soils are sensitive because of their potential to cause water quality impacts if disturbed and potential sedimentation of downstream perennial streams. In addition, the elevated salinity and possible sodicity of these soils reduces their reclamation potential (BLM, 1999b).

3.12 Vegetation and Noxious Weeds

Vegetation in the PAPA is described in Section 3.16 of the PAPA EIS. Along the proposed pipeline route vegetation is typical of the Green River Basin with communities that include grassland, sagebrush-steppe, wetland and riparian (see Section 3.13 of this EA). Most of the proposed route is characterized as sagebrush-steppe; dominant species are Wyoming big sagebrush, basin big sagebrush, Gardner saltbush, greasewood, and cushion plant communities (Knight, 1994). The understory includes western wheatgrass, needle-and-thread grass, Sandberg blue grass, prickly pear cactus, scarlet globemallow, and rabbitbrush. These species are adapted to aridic soils and require little water. Species composition varies depending on soil type, salinity, exposure and moisture levels.

Grassland communities along the proposed pipeline route are generally limited in size. This vegetative community is represented by portions of reclaimed rights-of-way that are adjacent to and overlapping the proposed pipeline as well as in small patches along the length of the proposed pipeline. The previously disturbed portions of the rights-of-ways include species that have been planted for reclamation. These vary by soil type and success but include western, crested and thickspike wheatgrasses, Indian ricegrass, fourwing saltbush, Sandberg bluegrass, and winterfat among others. With the exception of crested wheatgrass, these species and others like rabbitbrush are common in native grasslands of this region.

Noxious weeds are plants designated by a Federal, State or county government as injurious to public health, agriculture, recreation, wildlife or property. They are plants that are competitive, persistent, pernicious and often non-native. Invasive species are plants introduced into an environment with no natural enemies, such as insects or other plants, to limit their

reproduction and spread. They frequently dominate native vegetation if left unchecked.

Based on field reconnaissance, noxious weed establishment along the proposed route is limited to existing pipeline rights-of-way, roadsides, well pads and other previously disturbed areas. The most common weed observed within or near the proposed pipeline route is halogeton with others such as perennial pepperweed, Canada thistle and tamarisk present in wetter areas (Aimone, 2004).

3.13 Wetland and Riparian Resources

Riparian habitat is a highly valued vegetation community found along or around streams, lakes, ponds and other open water (both perennial and intermittent). This unique habitat is crucial to many fish and wildlife species known to occur in the area. Riparian vegetation helps maintain high water tables, stabilize streambanks, create quality fish and wildlife habitat, prevent or reduce flooding, and maintain and improve water quality (BLM, 1997).

Wetlands are lands where at least periodic inundation or saturation with water (either from the surface or subsurface) is the dominant factor determining the nature of soil development and the types of plant and animal communities living there. These include the entire zones associated with streams, lakes, ponds, springs, canals, seeps, wet meadows, and some aspen stands.

Section 3.18 of the PAPA EIS describes wetland and riparian resources found in the PAPA. Based on wetland reconnaissance identification and mapping of the proposed condensate pipeline route, wetland and riparian areas are limited and associated with the river crossings. Herbaceous wetland vegetation is present at each river crossing. At the Blacks Fork and Green river crossings, only thin margins of wetland are present along the water's edge. More extensive wetlands are present at the Hams Fork River and the New Fork River crossings. The floodplains that are adjacent to the Hams Fork and New Fork river crossings have wet swales dominated by herbaceous wetlands with small patches of shrubby riparian vegetation interspersed. The herbaceous wetlands are dominated by clustered field sedge, threesquare, bullrush, creeping spikerush, curly dock, foxtail barley, horsetail, arrow-grass, and other low-lying hydrophytic species.

Shrubby riparian communities identified along the proposed route are limited to stands of immature willows with scattered silver buffaloberry shrubs (BLM, 1999b). While forested riparian communities are present near the Green River and New Fork River crossings, no forested riparian vegetation is present within the proposed pipeline right-of-way.

3.14 Threatened and Endangered Species

This section provides information for both components of Questar's proposal because year-round drilling could have impacts different than those described in the PAPA EIS. It describes the potential for occurrence of these species along the proposed condensate pipeline route.

Federally listed threatened and endangered species and special status species that potentially occurred on the PAPA and in the vicinity of the gas sales pipeline were addressed in Section 3.19 of the PAPA EIS. At the time the PAPA EIS was prepared, Ute ladies'-tresses, black-footed ferrets, bald eagles, whooping cranes, and four species of Colorado River fish were considered potentially vulnerable to development on the PAPA or to construction of the gas sales pipeline. Canada lynx and mountain plover were species proposed for listing and swift fox was a candidate species for listing under the ESA at the time. Since then, Canada lynx were listed as threatened (FWS, 2000) while the proposal to list mountain plovers as threatened has been withdrawn (FWS, 2003a).

In addition to the listed species considered in the PAPA EIS, this section examines current status of gray wolf, grizzly bear and Canada lynx in the project area.

3.14.1 Listed Species

Year-round Drilling. Species and habitats discussed in this section include those that have been listed and are under protection of the Endangered Species Act (ESA). Those species are the black-footed ferret, bald eagle, gray wolf, Ute ladies'-tresses and Colorado River fish, identified by the U.S. Fish and Wildlife Service (FWS, 2004a) in a written communication to BLM (see Appendix E). Whooping crane and Canada lynx are included since they were addressed in the PAPA EIS. There are other species that are candidates for listing (yellow-billed cuckoos) and that have been petitioned for listing (pygmy rabbits and sage grouse) under the ESA (FWS, 2004a).

Black-footed Ferret. There is historical evidence that black-footed ferrets occurred in the Green River Basin. Ferrets are closely associated with prairie dog colonies, including those in sagebrush-grasslands (Cerovski *et al*., 2004).

FWS (2004b) has been evaluating the potential for prairie dog colonies in Wyoming to support black-footed ferrets. As a result, FWS has determined there are many areas in the State not likely to be inhabited

by the species, based on the quality of habitat and likelihood that ferrets, if ever they were present, are now extirpated in the areas. FWS (2004b) has determined that approximately 64 square miles of the PAPA (all or portions of T. 30 N. and 31 N., R. 109 W. and 110 W.) are within the Big Piney prairie dog complex in which surveys for black-footed ferrets are recommended. The remainder of the PAPA, including all of Questar's lease area, have been cleared for any further need to conduct surveys for the species (FWS, 2004b). There are no white-tailed prairie dogs present within the lease area (BLM, 2004c).

Whooping Crane. In the past, whooping cranes from the experimental flock introduced to the Grays Lake National Wildlife Refuge in Idaho would occasionally be observed along the upper Green River, in the vicinity of Merna and Cora. The last surviving crane in the population died in 2002 (Whooping Crane Conservation Association, 2004).

Gray Wolf. Since reintroduction of 31 animals in Yellowstone National Park (YNP) during 1995 and 1996, the gray wolf population in the Greater Yellowstone Recovery Area has grown to over 300 animals in 2003 (FWS *et al*., 2004). Those animals are classified as a nonessential experimental population (FWS, 2004b). Gray wolves inhabit coniferous forests as well as shrub and grasslands in mountains and foothills where they feed on big game as well as smaller prey species (Cerovski *et al*., 2004).

Packs have become established outside of YNP including two in the vicinity of the PAPA: the Green River Pack east of the PAPA in the upper Green River Basin in 2002 and the Daniel Pack northwest of the PAPA in 2003 (FWS *et al*., 2004). Since their establishment, both wolf packs have preyed on cattle and sheep and pack members in both have been killed in control actions.

Wolves have killed elk wintering on feedgrounds in the Pinedale Elk Herd Unit where one elk was killed on each of two of the three feedgrounds in the herd unit, Fall Creek and Scab Creek, during 2002-2003 (Clause, 2004a). Additionally, wolves killed 16 elk on the Black Butte and Soda Lake feedgrounds within the Green River Elk Herd Unit during 2003 (Clause, 2004b). Although portions of both elk herd units coincide with the PAPA, only the northern portion coincides with winter range utilized by elk in the Green River Herd Unit but that portion does not coincide with Questar's leasehold.

Bald Eagle. FWS proposed to remove the bald eagle from the list of endangered and threatened wildlife in 1999 (FWS, 1999), but delisting has not yet occurred and they remain a threatened species. Bald eagles nesting in northwestern Wyoming have been increasing steadily since 1978 (Patla *et al.*, 2003). Bald eagles nest in trees, including cottonwoods in riparian zones associated with large lakes and streams (Cerovski *et al.*, 2004).

In 2004, there were 2 active bald eagle nests within the PAPA, each producing 2 young (WGFD, 2004a). One of the nests was discussed in the PAPA EIS and was active in 1999 but farther than 1 mile from Questar's lease area. The other active nest is within 1 mile of the lease area. In Wyoming, bald eagle eggs hatch around May 1 and young fledge about July 10 (Johnsgard, 1986). However, nest building may be initiated during February (Call, 1978; FWS, 2004a). Once fledged, juvenile bald eagles may remain in the nest vicinity for a month, often through August (Isaacs *et al.*, 1983; FWS, 2004a).

Wintering bald eagles regularly occur in western Wyoming generally from November 1 through April 15 (FWS, 2004a). Observations of bald eagles and other wintering birds are reported by the Audubon Society from their Christmas Bird Counts. Christmas counts were made in the vicinity of the PAPA during December 1984 and 1987. Only one bald eagle was reported in each year.

In western Wyoming, Christmas Bird Counts have been made from Jackson to Evanston and from Star Valley to Lander. Numbers of bald eagles counted and hours of observation were compiled for each counting site in western Wyoming for each year since 1983 to derive an average of wintering bald eagles counted per hour of observation. Data indicate the number of observations of wintering bald eagles increased during the 1980s and early 1990s, and peaked in 1994. Since 1995, relative abundance of wintering bald eagles in western Wyoming appears to be lower than in the early 1990's but relatively consistent through 2003 (see Wildlife Technical Report in Appendix E of this EA).

In the northern Rocky Mountains, peak bald eagle migration occurs during March and November (Johnsgard, 1986). Migratory bald eagles have been observed during April and November in the vicinity of the PAPA and generally through the Green River basin (Patla, 2004).

Ute Ladies'-tresses. This species was not addressed in the PAPA EIS except for its possible occurrence along the Green River, in the vicinity of the gas sales pipeline crossing. Examination of that location revealed unsuitable habitat. Ute ladies'-tresses was listed as threatened in 1992 (FWS, 1992).

In Wyoming, Ute ladies'-tresses has been found on old oxbows or floodplain terraces associated with small streams on sites that remain moist (meadow plant

communities) throughout the summer, whether due to seasonal flooding or subirrigation (Fertig, 2000). All 4 of the known populations in the State occur in the eastern half; searches conducted in western Wyoming (Jackson Hole, National Elk Refuge and Green River basin) during the 1990s were unsuccessful (Fertig, 2000) and, given the ranges of elevation and precipitation regimes associated with site occurrence, the species' presence on Questar's lease area and within the PAPA is unlikely.

Condensate Pipeline. Information provided by the FWS (2004c) identified 17 threatened and endangered species and experimental populations that may be affected by projects occurring in Lincoln, Sweetwater, Sublette and Uinta counties. Four of the 17 are fish species that may be affected by water depletions in the Colorado River System. These include the bonytail, humpback chub, Colorado pikeminnow and razorback sucker. Seven of the listed species are associated with water depletions of the South Platte River and are not relevant to this project.

Black-footed Ferret. Black-footed ferrets rely almost entirely on prairie dogs for food and use prairie dog burrows for shelter and rearing their young. Suitable habitat for black-footed ferrets may be present within 0.5 mile of the proposed condensate pipeline right-of-way. Although black-footed ferrets have not been identified in the area crossed by the condensate pipeline, white-tailed prairie dog colonies are present and could provide potential ferret habitat. The pipeline crosses an area defined as the Moxa white-tailed prairie dog complex for 39.5 miles and an area defined as the Big Piney complex for 6.9 miles. Neither prairie dog complex has been exempted from recommended surveys for black-footed ferrets by FWS (2004b).

Bald Eagle. Bald eagle nesting and wintering habitat is present along the Green River and the New Fork rivers, potentially in the vicinity of the proposed condensate pipeline.

Grizzly Bear. The grizzly bear has a wide range of habitat tolerance. The preferred habitat for grizzly bears is typically contiguous, relatively undisturbed mountainous habitat with a high level of topography and vegetative diversity. This habitat type is not present in the vicinity of the proposed pipeline and grizzly bears are not expected in the vicinity.

Canada Lynx. A reproducing population of Canada lynx has been documented near Merna where they prey on snowshoe hares (Laurion and Oakleaf, 1998). Lynx are generally associated with dense coniferous forests (Englemann spruce-subalpine fir) at high elevations (Cerovski *et al*., 2004). Suitable habitats are not present in the vicinity of the proposed pipeline.

Gray Wolf. Wolves within Wyoming are protected under ESA although they have been designated a nonessential experimental population. Gray wolves are dependent on movements of big game and may occur in large ungulate migration, wintering or parturition areas. While unlikely, wolves could potentially be present in the vicinity of the proposed pipeline.

Colorado River Fish. There are 4 listed threatened and endangered fish species possibly present in the vicinity of the proposed pipeline. The FWS (2004a) has indicated that the bonytail, Colorado pikeminnow, humpback chub and razorback sucker may inhabit the Colorado River System in the vicinity of the proposed pipeline. No documented observations of these species in the vicinity of the proposed pipeline have been recorded.

Ute Ladies'-tresses. Field surveys were conducted for this plant within areas of suitable habitat in August 2004. Suitable habitat for orchids was observed on the north side of the Hams Fork River crossing. Surveys were conducted and no orchids were found. Historically, there are no documented observations of Ute ladies'-tresses in western Wyoming.

3.14.2 Candidate and Other Special Status Species

Currently, yellow-billed cuckoo is a candidate species, sage grouse and pygmy rabbits have been petitioned for listing under ESA. Other candidate and special status species that were addressed in the PAPA EIS are considered here, primarily with respect to potential effects by construction of the condensate pipeline.

Year-Round Drilling. In addition to listed species, there are a number of other species of concern that occur in the vicinity of the PAPA.

Yellow-billed Cuckoo. This species was petitioned for listing in 1998. Following a status review, FWS (2001) found that listing the western distinct population segment of yellow-billed cuckoos (including those in Wyoming) as threatened was warranted but precluded and the species is currently a candidate for listing (FWS, 2004a). The species is found in eastern Wyoming where it is associated deciduous woods and thickets along riparian zones (Dorn and Dorn, 1990 and Cerovski *et al*., 2004).

No yellow-billed cuckoos have been documented in the upper Green River Basin although breeding may have occurred southeast of the basin (Cerovski *et al*., 2004). There are 9 National Biological Survey Breeding Bird Survey (BBS) routes in the upper Green River area, some of which have been surveyed since 1980 though none with continuous records since then

(see Wildlife Technical Report in Appendix E of this EA). Yellow-billed cuckoos have not been reported in any of the BBS surveys that surround the PAPA. Further, breeding bird surveys conducted in 2002 on BLM lands that included the PAPA did not detect the species (McGee *et al*., 2002).

Sage Grouse. The eastern subspecies of greater sage grouse was petitioned for listing as endangered in 2002. Wyoming is included within the subspecies' range. However, the FWS determined that evidence was lacking to distinguish the eastern subspecies as a valid subspecies and therefore a distinct population segment applicable under the ESA (FWS, 2004d). A similar evaluation was rendered on a petition to list the western subspecies in 2003.

Currently, FWS (2004e) is reviewing the status of greater sage grouse but has not made a decision regarding its eligibility for ESA protection. Sage grouse are currently considered an upland game bird in Wyoming and the species is discussed in Section 3.15 of this EA.

Pygmy Rabbit. Pygmy rabbits in the Columbia Basin of Washington were listed as endangered in 2003 (FWS, 2003b) but that listing does not apply to the species in Wyoming. However, conservation groups have petitioned (April, 2003) FWS to list pygmy rabbits in the Intermountain West and Great Basin (Biodiversity Conservation Alliance *et al*., 2003), areas that include western Wyoming, as threatened or endangered. Pygmy rabbits have been designated as a sensitive species by BLM (BLM, 2001). Surveys conducted during spring and summer 2002 revealed their presence in tall, dense sagebrush at several locations within the PAPA (McGee *et al*., 2002). In addition, a specimen was found on the Mesa, apparently killed by a vehicle (Smith, 2004).

Swift Fox. This species is primarily associated with Great Plains grasslands in the eastern part of the state. Swift fox have not been documented in the vicinity of the PAPA (Cerovski *et al.*, 2004). A search was conducted in 2002 but no swift fox were found on or near the PAPA (McGee *et al*., 2002).

Mountain Plover. This neotropical migratory species is generally associated with short grass and mixed grass prairies but also nests in open areas within sagebrush-grasslands (Cerovski *et al.*, 2004). Mountain plovers have been documented on the Seedskadee BBS route, but only once in 1998. None have been reported on other BBS routes in the project vicinity.

Condensate Pipeline. In addition to Federally listed species, many species designated as BLM sensitive species have been identified as potentially occurring in the condensate pipeline project area.

Special Status Animal Species. According to Wyoming Natural Diversity Database, various State sensitive birds have been observed southeast of the Green River crossing in the Seedskadee National Wildlife Refuge. These include the American bittern, great blue heron, osprey, merlin, burrowing owl, and Bewick's wren. Trumpeter swans are very rare and it is unlikely that they are present in the vicinity of the proposed pipeline (BLM, 1999b).

Pygmy rabbits have been observed in the PAPA (McGee *et al*., 2002) and suitable habitat occurs along the proposed route. Swift fox are known to inhabit the sagebrush and grasslands in the vicinity of the proposed pipeline (BLM, 1999b), primarily near the southern terminus (Cerovski *et al.*, 2004). White-tailed prairie dogs are likely to be present along the proposed pipeline route. Other sensitive mammal species that have been identified as potentially occurring along the proposed route include the dwarf shrew and Wyoming pocket gopher.

State-sensitive fish that occur in the area are the roundtail chub, flannelmouth sucker, Colorado River cutthroat trout and the blue head sucker. The nearest cutthroat trout population to the proposed pipeline is more than 12 miles northwest of the proposed pipeline route (BLM, 1999b). Yellowstone cutthroat trout are known only to occur in the Yellowstone River system, but that does not coincide with this project.

Special Status Plant Species. BLM has indicated the following special status plant species may occur within the vicinity of the proposed pipeline: Cedar Rim thistle, large-fruited bladderpod, Beaver Rim phlox, and tufted twinpod.

3.15 Wildlife and Aquatic Resources

In their written communication to BLM regarding Questar's proposal (see Appendix A), WGFD focused on the benefits to wildlife habitat function that the proposal would provide, particularly with respect to minimizing animal disturbance and habitat disturbance. Habitat function is defined as "the arrangement of habitat features, and the capability of those features to sustain species, populations, and diversity of wildlife over time" and is central to recent recommendations for impact analysis and conservation of wildlife and habitat during oil and gas development in Wyoming (WGFD, 2004b). Scoping issues raised by interested groups and the public directly or indirectly focused on habitat function that could be affected by Questar's year-round drilling proposal. Pronghorn, mule deer, elk, and sage grouse were species identified.

Wildlife habitats and their functions on the PAPA, whether as wintering, breeding or nesting habitats, were described in detail in the PAPA EIS (see Section 3.20) and supporting documents. The nature of habitats on the PAPA and Questar's lease area has not changed from those analyzed in the PAPA EIS, although since 2000 there have been several wildlife studies completed and in progress that provide information unavailable when the ROD was issued. Much of that new information is presented in the section below and in the Wildlife Technical Report (see Appendix E). Where new information and data permit, the focus in this chapter and Wildlife Technical Report is on observed trends in wildlife presence and use of habitats on the PAPA and Questar's lease area since 2000.

3.15.1 Big Game

Year-Round Drilling

Pronghorn. The PAPA covers several seasonal ranges utilized by pronghorns in the Sublette Herd Unit. Those ranges were described in the PAPA EIS. Winter ranges on the PAPA are occupied by pronghorn that migrate from distant summer ranges in Grand Teton National Park (GTNP) and Bridger Teton National Forest (BTNF). Animals captured and equipped with radio telemetry collars there may begin migrating to the PAPA as early as October in some years, as late as December in others, taking approximately one month to complete the trek (Sawyer and Lindzey, 2000).

Pronghorn returning to GTNP may begin moving in April or earlier, depending on snow conditions (Sawyer and Lindzey, 2000). Pronghorn movements from crucial winter ranges on the southern slopes of the Mesa begin by shifting their distribution to the top of the Mesa, subsequently continuing north on the top and western edge of the Mesa (Sawyer and Lindzey, 2000).

To reach the PAPA, pronghorn summering in GTNP and BTNP must travel 50 to 80 miles while crossing numerous obstacles to movement including 47 fences, several highways including U.S. Highway 191, rivers (Upper Green River and Gros Ventre River), and pass through proliferating housing subdivisions with associated fences and roads (Sawyer and Lindzey, 2000). One migratory passage of particular concern is a bottleneck, constricted to 0.5 mile wide by the convergence of U.S. Highway 191, State Highway 352, riparian zones of the Green River and New Fork River, and private lands that have been subdivided, developed and fenced (Sawyer and Lindzey, 2000). In 2003, over 21 miles of highway right-of-way fencing was modified to provide better passage for migratory big game (WGFD, 2004c). In the vicinity of this migration constriction - the Trappers Point bottleneck (Sawyer and Lindzey, 2000) - the average daily traffic volume on U.S. Highway 191 has increased slightly from 1,670 vehicles (170 trucks)/24 hours in 1999 to 1,910 vehicles (200 trucks)/24 hours in 2003 (WDOT, 2004, unpublished data).

Long-term fawn production data (1978 to 2003) indicates an overall significant decline in the numbers of fawns per doe counted before harvest (see Wildlife Technical Report, Section 1). However, the herd unit population has been increasing recently. The WGFD population model – updated in 2004 (see Table 3-3) – estimated that the population increased from approximately 42,000 animals in 2000 to over 44,000 in 2003 (Christiansen, 2004). The modeled population simulations appear to be closely aligned with field observations.

Although the population has apparently increased during that 5-year period, fawn production since 1999 has been depressed (see Table 3-3) compared to earlier years, particularly in 1987 (see Wildlife Technical Report, Section 1). During the past 5 years, (1999-2003), harvest has been variable but has generally increased since 2001, especially the doe harvest which had increased 1.5 times between 2001 and 2003 (see Table 3-3). Nevertheless, doe harvest since 1999 has been much less than during the 1980s and early 1990s when harvest exceeded 5,000 does in 1992 (see Wildlife Technical Report, Section 1).

Annual adult doe survival rates, estimated from animals radio-collared in GTNP and BTNF, have been high, ranging from 97 percent survival in 1998-1999 to 84 percent survival in 1999-2000 (Sawyer and Lindzey, 2000). With recent trends of depressed fawn production and increased doe harvest though, population growth since 2000 suggests that fawn survival, including survival during winter, has been high. Alternatively, fawn survival may be decreasing, a result of density-dependent growth if the population is at or near equilibrium density (carrying capacity).

Mule Deer. Much of the PAPA and Questar's lease area coincides with crucial winter range utilized by mule deer in the Sublette Herd Unit and is described in the PAPA EIS. Mule deer that summer in mountainous terrain surrounding the PAPA to the west (Salt River Range and Wyoming Range), north (Snake River Range and Gros Ventre Range), and east (Wind River Range) migrate to winter ranges on the PAPA and Pinedale Front complex, traveling up to 60-100 miles (Sawyer and Lindzey, 2001). A few mule deer appear to be yearlong residents of the Pinedale Mesa (Sawyer and Lindzey, 2001).

Table 3-3 Pronghorn Sublette Herd Unit Population, Productivity and Harvest						
Year	Postseason Population Estimate	Preseason Fawns per Doe	Harvest			
			Bucks	Does	Fawns	Total
1999	44,191	0.763	2,909	2,113	374	5,396
2000	42,097	0.570	3,447	2,492	343	6,282
2001	43,348	0.619	2,245	1,053	373	3,671
2002	43,630	0.615	2,467	1,477	212	4,156
2003	44,239	0.597	2,435	1,585	161	4,181

Depending on snow conditions, mule deer may begin arriving on winter ranges on the Pinedale Mesa and PAPA during late October (Sawyer and Lindzey, 2001), later during mild winters. Deer may move northwest, to the vicinity of Cora Butte, during winter if conditions are mild (Sawyer *et al*., 2003). Most migratory mule deer wintering on the Pinedale Mesa begin movements to summer range in late March or early April; again, the timing of movements depends on weather conditions (Sawyer and Lindzey, 2001).

The population model for the Sublette Mule Deer Herd Unit was updated in 2004 (see Table 3-4). Since 1995, the population has increased from approximately 27,000 to over 37,000 in 2001, declined to 33,000 animals in 2002 but increased the next year (Clause, 2004c). The modeled population simulations appear to be closely aligned with field observations. Following winter 1992-1993, the population was at an all-time low due in part to a harvest regime aimed at reducing numbers of deer but also due to severe conditions that winter (Smith, 2003). Until recently, WGFD eliminated or greatly reduced doe and fawn harvest (harvest of any deer) to accelerate population growth (Smith, 2003). Harvest of all sex and age groups was further reduced during 2003 (Clause, 2004c).

Two measures of fawn production are provided in Table 3-4. WGFD conducts composition surveys of mule deer after harvest and the postseason ratios of fawns per doe reflect those counts. If there are larger numbers of does than fawns harvested, relative to their occurrences in the population, the postseason counts will indicate more fawns per doe than would be present if there were no harvest of does. Thus, the estimate of fawns per doe adjusted for harvest can be used to compare fawn production in years with no doe harvest to production in years with harvest (Ayers *et al*., 2000). For example, the adjusted production in 2002 of 0.618 fawns per doe (rather than 0.644 fawns per doe, unadjusted for doe and fawn harvest) is not much better than fawn production in 1995 when no does were harvested (0.605 fawns per doe, one of the lowest years of fawn production in the last 2 decades (see Wildlife Technical Report, Section 1).

No trend in fawn production in the Sublette Herd Unit, whether as the unadjusted ratio of fawns per doe or ratio adjusted for harvest, is evident over time or similar to the significant decreasing trend observed for pronghorn (see Wildlife Technical Report, Section 1). However, depressed fawn production observed since 2000 has been attributed to drought conditions (Smith, 2003). Though not estimated for the whole Sublette Herd Unit, annual precipitation by water year has been approximated for crucial winter ranges in the herd unit (see Wildlife Technical Report, Section 2). Annual precipitation from 2000 through 2003 has been well below the average of the previous 30 years. By the time herd composition surveys were conducted in 2001, there had been 2 consecutive years of below-average precipitation (including winter snowfall), 3 consecutive years in 2002 and 4 in 2003. That trend of low precipitation continued at least through water year 2003 (see Wildlife Technical Report Section 2) but the most recent estimate of fawn production indicates an increase of fawns per doe in 2003 (Clause, 2004c). Fawn production in the herd unit may be related to precipitation and concomitant vegetation growth on summer ranges and lower mid-elevation transitional ranges rather than precipitation patterns on the winter range.

Overwinter survival of fawn and adult mule deer in the Sublette Herd Unit has been estimated since 1993 (see Wildlife Technical Report, Section 2). Throughout the period of data collection, adult overwinter survival rates have been high, ranging from 73.5 percent survival (26.5 percent mortality) in 2002-2003 to 97 percent survival (3 percent mortality) in 1998-1999. Adult mortality rates in 1993-1994 and 1999-2000 were very low in those years (see Wildlife Technical Report, Section 2).

Survival of adult doe mule deer in the Sublette Herd Unit has also been monitored by radio telemetry (Sawyer *et al*., 2003). In general, overwinter survival rates of telemetered adult does have deviated (though are not significantly different) from survival rates estimated by age ratios (Wildlife Technical Report, Section 2) but have been consistently above 80

Table 3-4 Mule Deer Sublette Herd Unit Population, Productivity, and Harvest							
Year	Postseason Population Estimate	Unadjusted Fawns per Doe Postseason	Fawns per Doe Adjusted for Harvest	Harvest			
				Bucks	Does	Fawns	Total
1995	26,893	0.605	0.605	1,286	0	0	1,286
1996	26,389	0.727	0.727	1,454	0	0	1,454
1997	24,950	0.841	0.840	1,083	17	0	1,100
1998	27,516	0.705	0.705	1,852	0	0	1,852
1999	32,594	0.795	0.794	2,478	23	10	2,511
2000	36,564	0.819	0.810	2,991	226	22	3,239
2001	37,358	0.704	0.694	2,787	372	64	3,223
2002	32,949	0.644	0.618	2,742	817	71	3,630
2003	34,022	0.782	0.769	1,946	305	35	2,286

percent survival since that study began in 1999 (Sawyer *et al*., 2003).

Fawn overwinter mortality rates, estimated by changes in age ratios (Wildlife Technical Report, Section 2), have generally been higher than adult deer mortality rates in any given year (fawn mortality has been significantly higher than adult mortality since winter 2001-2002). On the PAPA and other winter ranges in the Sublette Herd Unit, overwinter fawn mortality is directly related to total snowfall during November through March. In addition, there are indications that drought conditions on the winter range since 2000 have contributed to elevated fawn overwinter mortality observed since 2001-2002 (Wildlife Technical Report, Section 2). Estimated fawn mortality rates of 52 percent (52 percent of fawns alive in December died by April) observed after winter 2002-2003 and 64 percent mortality observed after winter 2003-2004 were significantly higher that expected, based on the relationship of fawn mortality to total snowfall observed prior to 2000. With below-average precipitation since 2000, winter ranges had been subject to 3 and 4 consecutive years of drought prior to those 2 winters. To some degree, similar drought-effects on fawn mortality were observed for mule deer in the Wyoming Range Herd Unit (Wildlife Technical Report, Section 2).

There are undoubtedly additional factors that have affected fawn mortality since 2000. In particular, the estimated fawn mortality rate of 44.5 percent observed after the relatively mild winter of 2000-2001 was significantly higher than expected, but drought conditions had not been as prolonged as in subsequent years. Such elevated fawn mortality was not observed on winter ranges in the Wyoming Range Herd Unit after that same mild winter.

The Trappers Point Bottleneck described above for pronghorn, also limits migration of mule deer to winter ranges on the PAPA and return spring movements to northern summer ranges (Sawyer and Lindzey, 2001). The bottleneck may contribute to mule deer-vehicle mortality in the 7-mile length of U.S. Highway 191 between Pinedale and Daniel Junction. Available data indicate that many more deer have been killed by vehicles than pronghorns in that 7-mile length of highway (WGFD, 2004d). Generally, the proportion of fawns killed by vehicles is larger than their proportion in the mule deer population but numbers killed since 2001 don't appear to be sufficient to account for the observed increase in over-winter fawn mortality.

Elk. The PAPA coincides with two elk herd units, the Green River and Pinedale Elk Herd Units. There are no seasonal ranges on the PAPA that are occupied by elk in the Pinedale Herd Unit and only the northern-most portion of the PAPA is occupied as winter range by elk in the Green River Herd Unit (BLM, 1999a). Population models for both herd units were updated in 2004 (see Table 3-5). Since 1993, both populations have decreased from over 4,000 animals to just over 2,000 in 2003 (Clause, 2004a and 2004b).

As discussed for mule deer, there are two measures of calf production provided in Table 3-5 since WGFD conducts composition surveys of elk after harvest. The estimate of calf per cow, adjusted for harvest (see Wildlife Technical Report, Section 1), can be used to compare annual calf production in the same herd unit with different levels of calf and cow harvest each year and between herd units with different harvest levels (Reeve *et al*., 2003). Since 2000, calf production in the Green River Herd Unit appears lower than in the Pinedale Herd Unit. Harvest of all sex and age groups has decreased in both herd units since 2000 (see Table 3-5).

Table 3-5 Elk Green River and Pinedale Herd Unit Populations, Productivity, and Harvest								
Herd Unit and Year	Postseason Population Estimate	Unadjusted Calf per Cow Postseason	Calf per Cow Adjusted for Harvest	Harvest				
				Bull	Spike	Cow	Calf	Total
Green River								
1993	4,584	0.263	0.265	147	34	285	82	548
1994	4,626	0.393	0.380	244	40	358	101	743
1995	4,427	0.278	0.269	141	50	315	60	566
1996	4,460	0.347	0.353	144	22	330	134	630
1997	4,254	0.319	0.298	171	37	326	42	576
1998	4,068	0.321	0.302	145	26	313	46	530
1999	3,855	0.248	0.248	138	24	212	54	428
2000	3,461	0.317	0.315	190	54	345	104	693
2001	3,122	0.302	0.284	157	37	280	45	519
2002	2,544	0.203	0.222	178	17	342	109	646
2003	2,049	0.227	0.225	179	27	260	55	521
Pinedale								
1993	4,164	0.205	0.203	182	12	159	25	378
1994	4,119	0.341	0.324	327	29	241	35	632
1995	3,997	0.226	0.220	162	39	148	16	365
1996	3,915	0.382	0.362	230	50	270	52	602
1997	3,666	0.267	0.256	209	45	251	37	542
1998	3,478	0.381	0.345	299	35	323	38	695
1999	3,391	0.271	0.277	182	40	121	47	390
2000	3,079	0.350	0.353	255	61	347	127	790
2001	2,771	0.300	0.278	206	38	272	39	555
2002	2,412	0.241	0.235	237	28	203	39	507
2003	2,130	0.269	0.273	175	23	231	70	499

Long-term trends for elk in the Green River Herd Unit indicate calf production has been significantly declining since the late 1970's. Data for the Pinedale Herd Unit do not reveal such a significant declining trend (see Wildlife Technical Report, Section 1).

Wintering elk in both herd units are sustained on feedgrounds that, in part, are maintained to avoid elk conflicts with livestock and private property, especially for elk in the Pinedale Herd Unit (Clause, 2004a). The Scab Creek, Muddy Creek and Fall Creek feedgrounds in the Pinedale Herd Unit have been established since 1976 and combined, supported 1,843 elk during winter 2003-2004 (Clause, 2004a). Three feedgrounds in the Green River Herd Unit (Black Butte, Green River Lakes and Soda Lake) supported 1,632 elk during winter 2003-2004 (Clause, 2004b). Elk on all 6 feedgrounds are vaccinated against brucellosis each year.

Condensate Pipeline

Pronghorn. Pronghorn antelope habitats for animals in the Sublette and Carter Lease herd units are present along the entire proposed pipeline route. The pipeline route would cross approximately 78 miles of spring/summer/fall (SSF), 8 miles of crucial winter (CRUWIN), 19 miles of crucial winter yearlong (CRUWYL), and 2 miles of winter year-long (WYL) ranges.

The proposed condensate pipeline will cross through the Pronghorn Sublette Herd Unit north of U.S. Highway 30 and will cross the Carter Lease Herd Unit to the south of the highway.

Mule Deer. Three populations of mule deer have seasonal ranges that are crossed by the proposed pipeline route. The Sublette, Steamboat and Wyoming Range herd units' migration routes as well as approximately 5 miles of WYL, 3 miles of yearlong (YRL), and 3 miles of SSF ranges would be crossed by the proposed pipeline. Most of the pipeline project area, while within a portion of a herd unit, does not contain enough animals to be important habitat, or the habitats are of limited importance to the species. These areas are classified as OUT (WGFD, No Date).

Elk. Two elk herd units are crossed by the proposed pipeline route. Both the Pinedale and the West Green River herd units coincide with the proposed pipeline. Approximately 6 miles of crucial severe winter relief range (SWR) will be crossed by the pipeline route below Fontenelle Dam. SWR ranges are used during extremely severe winters (WGFD, No Date). The remaining portion (95 percent) of the project area is classified as OUT.

Moose. Two moose herd units are present along the proposed pipeline route. The Sublette and Lincoln moose herd units would be crossed by the pipeline

route through approximately 5 miles of YRL, 1 mile of WYL, 2 miles of CRUWYL ranges, but the remainder of the project crosses habitat that is either outside the species range or is habitat of undetermined value (WGFD, No Date).

3.15.2 Upland Game Birds

Year-Round Drilling. WGFD has records of 52 sage grouse leks within the PAPA and 14 others within 2 miles of the boundary; 26 leks are on or within 2 miles of Questar's lease. Not all leks are active but there currently are 6 active leks within 2 miles of Questar's lease area.

Adult male sage grouse are first to arrive on leks, usually by mid-March, thereafter joined by sub-adult males and females (Lyon, 2000). Females move to nest site vicinities several days after copulation (Lyon, 2000). Although there are reports that most females nest within 2 miles of leks where bred (Braun *et al*., 1977), some sage grouse hens on the PAPA have nested farther than that; the largest distance from lek to nest was over 28 miles, observed for one female (Lyon, 2000). Sage grouse hens tend to nest in the same vicinity in consecutive years (Lyon, 2000).

In the PAPA EIS, sage grouse nesting habitat was assumed to include areas within a 2-mile radius around each active and inactive lek, even though distances from leks to nests in the region can be quite variable (Heath *et al*., 1997 and Lyon, 2000). With a 2-mile radius inscribed around each of the 26 leks that are on or within 2 miles of Questar's lease area, there is only a small portion (approximately 394 acres) of the lease area that is not within 2 miles of any lek (T. 33 N., R. 109 W., Sections 27, 34, and 35; T. 32 N., R. 109 W., Section 3).

The PAPA is within Upland and Small Game Management Area (USGMA) 3 (Sublette) north of the New Fork River and in USGMA 7 (Eden) south of the New Fork. WGFD has documented harvest data, including total hunters, total recreation-days, and total sage grouse harvested on both USGMAs since 1982. With data from both areas combined, there have been significant declining trends in numbers of hunters, total recreation-days spent hunting, and total sage grouse harvested during the past 2 decades.

While there has been a significant increasing trend in the number of recreation-days spent per hunter during that time, the total number of sage grouse harvested per recreation day has significantly declined from 1.7 per day in 1983 to 0.5 per day in 2002, indicative of declining sage grouse abundance (see Table 3-6, also see Wildlife Technical Report, Section 1).

Annual census of sage grouse leks has been used to track changes in the breeding population (Connelly *et al*., 2004), particularly if leks are censused repeatedly within a given year so that the peak in male attendance can be determined (Jenni and Hartzler, 1978). Leks attended by male sage grouse on numerous leks in the vicinity of and within the PAPA have been intensively monitored between 1999 and 2004 (Holloran and Anderson, 2004 and Matt Holloran, 2004. Unpublished data).

Maximum and average counts of attending male grouse in a breeding season, averaged for all leks counted, show declining trends in the local breeding population (see Table 3-7).

Sage grouse also winter on the PAPA. Sage grouse movements to winter ranges can take some time and may occur between late August and December. For example, most radio-telemetered sage grouse were on the PAPA and vicinity by November 1998 but arrived later in the PAPA in 1999, possibly due to mild weather that year (Lyon, 2000). Wintering sage grouse depend, in part, on sagebrush extending above the snow and Lyon (2000) documented numerous wintering sage grouse on the Mesa and some within the PAPA south of the New Fork River (2000). Likewise, distributions of sage grouse winter fecal pellet groups surveyed by Wyoming Wildlife Consultants (BLM, 2004d) from 2001 through 2003 indicate wintering grouse are present on the PAPA, north and south of the New Fork River.

Condensate Pipeline. Sage grouse is the predominant upland game bird in southwestern Wyoming and is known to occur within or near the proposed route. Other upland game bird species such as ruffed grouse, blue grouse, partridge, pheasant, ptarmigan and mourning dove have ranges that extend near the proposed pipeline route (Keinath, 2003).

Forty-three sage grouse leks have been identified as potentially occurring within 2 miles of the proposed pipeline. These leks were identified in 23 different locations with 20 of the 43 overlapping. Any sagebrush habitat within 2 miles of a lek is considered potential nesting habitat. The proposed pipeline route will pass through potential nesting habitat (within 2 miles of an active or inactive lek) for 41.8 miles.

Table 3-6 Sage Grouse Harvest Data (Total Hunters, Total Recreation Days, and Total Harvest) and Derived Statistics in Upland and Small Game Management Areas (USGMA) 3 and 7, Combined. Portions of Both USGMAs Coincide with the PAPA						
Year	Hunters	Hunter Days	Harvest	Days per Hunter	Days per Harvest	Harvest per Day
1982	3,504	7,260	11,496	2.07	0.63	1.58
1983	4,054	10,181	17,686	2.51	0.58	1.74
1984	4,491	10,009	16,579	2.23	0.60	1.66
1985	4,194	9,393	14,400	2.24	0.65	1.53
1986	3,804	9,202	14,172	2.42	0.65	1.54
1987	3,833	9,191	16,083	2.40	0.57	1.75
1988	4,271	9,541	15,199	2.23	0.63	1.59
1989	3,564	8,142	12,073	2.28	0.67	1.48
1990	3,056	7,303	12,133	2.39	0.60	1.66
1991	3,225	8,549	12,901	2.65	0.66	1.51
1992	2,548	7,455	9,955	2.93	0.75	1.34
1993	2,830	7,939	9,195	2.81	0.86	1.16
1994	2,235	6,105	7,745	2.73	0.79	1.27
1995	1,521	4,523	4,637	2.97	0.98	1.03
1996	1,354	3,735	4,063	2.76	0.92	1.09
1997	1,152	3,428	3,393	2.98	1.01	0.99
1998	1,431	3,628	4,793	2.54	0.76	1.32
1999	1,764	5,316	5,867	3.01	0.91	1.10
2000	1,936	4,540	5,562	2.35	0.82	1.23
2001	1,177	3,632	3,137	3.09	1.16	0.86
2002	502	1,553	793	3.09	1.96	0.51
2003	665	1,850	1,484	2.78	1.25	0.80

Table 3-7 Male Sage Grouse Attendance Averaged For All Leks Censused on the PAPA and Vicinity of the Year-Round Drilling Proposal Since 1999			
Year	Total Leks Censused in Year	Maximum Males Counted per Lek	Average Males Counted per Lek
1999	10	59.6	42.9
2000	11	51.3	41.3
2001	17	57.3	42.0
2002	18	46.6	38.7
2003	21	44.5	36.3
2004	20	45.3	36.3

3.15.3 Migratory Birds

Data compiled for 9 National Biological Survey BBS routes in the upper Green River area reveal 150 bird species have been observed on one or more routes since 1980 (Sauer *et al*., 2004). Of those, 107 species are listed as Nearctic-Neotropical migratory birds by FWS, Division of Bird Habitat Conservation, pursuant to the Neotropical Migratory Bird Conservation Act.

Not all species on BBS routes are migrants though, and data for many of the migratory species is sparse, limited to only a few observations some years on a few routes. Data were scanned for deficiencies, including low abundance and low occurrence on BBS routes (Sauer *et al*., 2004). With only 9 routes total in the region, there were only 23 migratory species with barely adequate data to estimate trends over the past 10-year period (1994-2003). Those species and their apparent recent trends (past 2-3 years) are listed in Table 3-8.

Recent trends of abundances for 6 species appear to be declining. Four of those nest on or close to the ground (killdeer, common nighthawk, rock wren and sage thrasher) but nest in a variety of habitats. Three declining species inhabit wetland and/or riparian habitats (killdeer, yellow warbler and red-winged blackbird). Abundance of other species that utilize riparian or other moist habitats appears to be increasing (tree swallow, bank swallow, barn swallow and song sparrow) although those species nest above ground level. Other species that appear to be increasing include western meadowlark, Brewer's blackbird and brown-headed cowbird; the

Table 3-8 Common Neotropical Migratory Birds in the Vicinity of Questar Project Components with Recent Trends Estimated From National Biological Survey Breeding Bird Survey Data from 1994 to 2003			
Common Name	**Nest Substrate[1]**	**General Habitat[1]**	**Recent Trend**
American Kestrel *Falco sparverius*	Tree cavity, abandoned nest	All habitats	No trend
Killdeer *Charadrius vociferus*	Ground	Shoreline, aquatic sites in most habitats	Decreasing
Mourning Dove *Zenaida macroura*	Tree, ground, abandoned nest	All habitats	No trend
Common Nighthawk *Chordeiles minor*	On ground	Open, semi-open habitats, agriculture	Decreasing
Horned Lark *Eremophila alpestris*	On ground	Shrubland, grassland	No trend
Tree Swallow *Tachycineta bicolor*	Tree cavity, other cavities	Riparian cottonwood, aspen with cavity trees	Increasing
Violet-green Swallow *Tachycineta thalassina*	Tree cavity, other cavities	Aquatic habitats with cavity trees	No trend
Bank Swallow *Riparia riparia*	Burrow in bank or cliff	Aquatic habitats with cavity banks, cliffs	Increasing
Cliff Swallow *Petrochelidon pyrrhonota*	Attached to natural, man-made structure	Aquatic habitats with substrate for nest	No trend
Barn Swallow *Hirundo rustica*	Attached to natural, man-made structure	Near aquatic habitats with substrate for nest	Increasing
Rock Wren *Salpinctes obsoletus*	In cavity or crevice	Rock outcrops/piles in shrubland, grassland	Decreasing
Mountain Bluebird *Sialia currucoides*	In cavity in snag	Most habitats with nest cavity tree, snag	No trend
American Robin *Turdus migratorius*	In deciduous or coniferous tree	All habitats with trees, shrubs	No trend
Sage Thrasher *Oreoscoptes montanus*	In or beneath sagebrush shrub	Sagebrush shrubland	Decreasing
Yellow Warbler *Dendroica petechia*	In shrub or small deciduous tree	Riparian shrub, trees	Decreasing
Brewer's Sparrow *Spizella Breweri*	In shrub	Sagebrush shrubland	No trend
Vesper Sparrow *Pooecetes gramineus*	On ground	Shrubland, grassland, agriculture	No trend
Sage Sparrow *Amphispiza belli*	In or beneath sagebrush shrub	Sagebrush shrubland	No trend
Song Sparrow *Melospiza melodia*	In grass clump or in a shrub	Riparian cottonwood, shrub, marsh	Increasing
Red-winged Blackbird *Agelaius phoeniceus*	On emergent vegetation	Riparian shrub, marsh, agriculture	Decreasing
Western Meadowlark *Sturnella neglecta*	On ground	Shrubland, grassland, agriculture	Increasing
Brewer's Blackbird *Euphagus cyanocephalus*	Tree or shrub just above ground	Deciduous forest, shrub, grass, urban	Increasing
Brown-headed Cowbird *Molothrus ater*	Parasitizes nests of other birds	Riparian cottonwood, shrub, agriculture, urban	Increasing

[1] Abbreviated from descriptions by Cerovski *et al*., 2004.

latter two species have some affinity for human-altered habitats and western meadowlarks are often associated with agriculture (Cerovski *et al*., 2004).

Many common raptor species are known to nest, migrate, and seasonally reside, in the general vicinity of the proposed pipeline route and Questar's lease area. These include golden eagle, red-tailed hawk, ferruginous hawk, great horned owl, bald eagle, Swainson's hawk, northern harrier, prairie falcon, American kestrel, merlin, and osprey. Sharp-shinned hawk, Cooper's hawk, northern goshawk, burrowing owl and long-eared owl may also be present in the area during the summer months. Birds that may winter in the area include golden eagle, red-tailed hawk, rough-legged hawk and great horned owl as well as other less common species (Call, 1978).

3.15.4 Wild Horses

The Little Colorado Desert Wild Horse Herd Management Area (WHHMA) overlaps approximately 23 miles of the proposed pipeline route. These horses are managed as an important part of the natural system under the multiple-use concept (BLM, 1995).

3.15.5 Aquatic Resources

Aquatic resources in the PAPA are described in Section 3.20 of the PAPA EIS. Fisheries resources along the condensate pipeline route are limited to the four perennial rivers crossed by the proposed pipeline. Other crossed drainages are intermittent and do not support fisheries. The Blacks Fork River is known to support channel catfish. The Green River below Fontenelle Dam supports brown, rainbow and cutthroat trout and spawning for kokanee salmon in October. The Hams Fork River is known to support several trout species including rainbow, brown, cutthroat and brook. The New Fork River is known to support rainbow and brown trout (BLM, 2004a).

3.16 Air Quality

Air quality in and adjacent to the PAPA is described in the PAPA EIS in Section 3.11. At the time the PAPA EIS was written, the project area and general vicinity was in attainment for all the National Ambient Air Quality Standards (NAAQS) and Wyoming Ambient Air Quality Standards (WAAQS) and is still currently in attainment for those standards. Because the project area is in attainment for NAAQS and WAAQS, the following discussion of air quality impacts reveals no significant deterioration in those applicable air quality standards.

Projected air pollutant emissions from construction and operation of the Pinedale Anticline development project were based upon the analysis assumptions contained in the Pinedale Anticline EIS and Technical Report (BLM, 1999a). Actual emissions from current operation of the PAPA are expected to be the same as that predicted in the PAPA EIS (the number of operating wells has not exceeded those analyzed in the PAPA EIS). However, actual emissions from construction have most likely exceeded those proposed in the PAPA EIS. For example, the PAPA EIS assumed that there would be eight drilling rigs operating in the PAPA at any one time. In the summer of 2004 there were 32 rigs operating in the PAPA. In addition, drilling rig horsepower exceeds that assumed in the PAPA EIS for a single rig. The PAPA EIS assumed that a single drilling rig would require 1,000 horsepower and it is now estimated that a single drilling rig horsepower in the PAPA ranges from 3,000 to 5,000 horsepower. The main pollutant of concern with drilling rig emissions is nitrogen oxides (NO_x). Table 3-9 provides a comparison of the NO_x emissions predicted in the PAPA EIS with the current level of NO_x emissions from drilling rigs. As shown in the table, estimated current NO_x emissions are more than twice the amount analyzed in the PAPA EIS, though this increase does not rise to a level of significance. As noted, the area is still in attainment, and when the produced water and condensate pipelines are functional NO_x emissions from other sources (i.e., well completions, truck traffic, wellhead production equipment and compressors) are currently equal to or below that analyzed in the PAPA EIS because the field has not been fully developed.

As discussed in the PAPA EIS in Section 3.11, the PAPA is classified as a Prevention of Significant Deterioration (PSD) Class II area. There are several Class I and II areas in the vicinity which are areas of concern, including Bridger and Fitzpatrick wilderness areas. The main concern with the wilderness areas is visibility.

During scoping questions were raised regarding emissions of volatile organic compounds (VOCs) and hazardous air pollutants (HAPs) in the PAPA. The primary source of these pollutants is the wellhead production equipment including three-phase separation, triethylene glycol dehydration and condensate storage. Reported emissions (to WDEQ) from operators in and adjacent to the PAPA show that the actual emissions on a per well basis are less than those analyzed in the PAPA EIS. Also, because the PAPA EIS analyzed for the operation of 700 wells and to date there have only been approximately 200 wells drilled within the PAPA, the

emissions of VOCs and HAPs would not have exceeded the level of analysis in the PAPA EIS.

Table 3-9
Comparison of PAPA EIS ROD Level of Emissions and Estimated 2004 NO_x Emissions

	PAPA EIS ROD Level of Analysis - NO_x Emissions (tons/year)	Estimated 2004 NO_x Emissions (tons/year)
Construction[1]	4.76	4.76
Drill Rigs[2]	221.01	1,714
Production[3]	44.76	8
Compression[4]	376.59	122
Completion/Flaring[1]	46.50	46.50
Total	**693.62**	**1,895.26**

[1]. Estimated current NO_x emissions are those used in the PAPA EIS because more current construction and completion/flaring data is unavailable.
[2] Average is 3,500 horsepower per drilling rig; 14 g/hp-hr; load factor is 0.42; assumes 4,010 drilling days per year.
[3]. Production emissions based on 100 wells at 0.08 tons per year.
[4]. Compressor emissions are actual emissions reported to WDEQ.

CHAPTER FOUR
ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

This chapter describes the environmental consequences of BLM approval of Questar's Proposed Action and each of the alternatives described in Section 2.6. This chapter discusses both adverse impacts and benefits associated with the Proposed Action and the alternatives. Like the other EA chapters, this chapter does not repeat information contained in the PAPA EIS.

For some resources, particularly wildlife, year-round drilling will result in additional impacts that were not analyzed in the PAPA EIS. Potential impact to wildlife was a prevalent topic in comment letters received during scoping (see Section 2.2). Some impacts to other PAPA resources from year-round drilling will be less than those described in the PAPA EIS because surface disturbance, on-site storage tanks and traffic would be reduced. Because the impacts of the condensate pipeline were not disclosed in the PAPA EIS, complete descriptions of those resource impacts are provided in this document.

Questar has committed to a number of mitigation measures to offset impacts from the Proposed Action. These mitigation measures are described in Section 2.5 and their benefits explained in this chapter. One of the more important applicant-committed mitigation measures is Questar's proposal to drill up to 20 wells from individual well pads, which would reduce overall surface disturbance necessary to develop their remaining potentially-productive lease acreage. According to Questar, this level of concentrated pad drilling is economically attractive only if winter drilling restrictions are waived. The PAPA EIS anticipated as many as 4 well pads/section in Questar's lease area. Questar's proposal would result in development of the lease acreage with fewer well pads than anticipated by the PAPA EIS.

It is also important to recognize that the No Action Alternative would only preclude installation of the condensate pipeline and preclude winter drilling in mule deer winter range and sage grouse breeding and nesting habitat during periods identified in the PAPA ROD. This alternative would not preclude Questar from continuing development of their lease area in mule deer winter range or sage grouse breeding and nesting habitat. Development of these areas was approved by the PAPA ROD and will go forward regardless of the alternative selected by BLM. Consequently, if the No Action Alternative is selected, the impacts to resources discussed in Chapter 4 of the PAPA EIS will still occur.

Section 3 of the PAPA ROD contains specific administrative requirements and conditions of approval (COAs) designed, in large part, to protect environmental resources in the PAPA. Where such requirements and COAs are resource-specific, consistency of each with Questar's proposal to drill year-round is discussed.

This chapter also discusses cumulative impacts. The cumulative impact assessment includes all existing, proposed and connected actions (i.e., the previously-approved produced water gathering system).

4.2 Socioeconomics and Environmental Justice

4.2.1 Proposed Action

Impacts to socioeconomic resources from year-round drilling are expected to be mostly positive. Currently, drilling within Questar's lease area primarily occurs between May and November (although drilling occurs year-round in other portions of the PAPA outside of MA 5). Drilling is generally prohibited in the lease area during the winter months, although BLM has granted an exception for a single well pad with a single rig for each of the past two winters (2002-2003 and 2003-2004) to gather data for mule deer research. The result of the current winter drilling restriction on Questar's lease area is an annual cycle of intensive summer drilling activity followed by very little winter activity. In the summer Questar attempts to drill and complete as many wells as possible before winter. This cyclic development schedule also occurs on other operator's leases in the PAPA where seasonal drilling restrictions exist. Although difficult to quantify, some local businesses suffer from an annual "boom and bust" cycle which affects their cash flow and ability to retain workers.

If year-round drilling is permitted in Questar's lease area, it is expected that the current "frantic" pace of summer development would be reduced over a portion of the PAPA and that peak summer workforce, traffic, dust, noise and other impacts would decrease. Intensive summer development activities in Questar's lease area would be replaced with a more moderate pace of activity year-round. This could be particularly beneficial to Pinedale because Questar holds most of the leases adjacent to the town.

Year-round drilling could somewhat moderate the seasonal cyclic nature of portions of the local economy and some workers may be encouraged to relocate their families to the area on a permanent basis rather

than living in temporary housing during the summer drilling season. Eliminating the seasonally-cyclic nature of drilling on Questar's lease area may provide permanent employment for some of the direct and indirect workforce that are now hired on a seasonal basis.

Some have suggested the Questar's Proposed Action would help stabilize school enrollment in the project area. However, it is difficult to determine what effect, if any, would occur at this time. Other operators in the PAPA will continue to be subject to winter drilling restrictions which may mask any positive effects from Questar's proposal.

According to Questar, based on suitable rig-availability for just the summer drilling season and overall lease development economics, year-round drilling would allow development of their leases in about half the time (from 18 to 9 years). This would accelerate Federal, State and county government receipt of revenues from production. Construction of the condensate pipeline would result in additional sales tax revenues and assessed valuation.

Questar estimates that operation of the condensate pipeline and previously-approved produced water gathering system would reduce tanker traffic in the lease area by approximately 25,000 truck trips annually under peak production. The pipeline would reduce trucking opportunities for firms that currently provide this service to Questar. However, this impact cannot be quantified and it is possible that truck capacity may be absorbed by current and future needs elsewhere in southwestern Wyoming.

None of the counties affected by the condensate pipeline or year-round drilling have a high proportion of minority or low income populations. Therefore, there would be no disproportionate socioeconomic impacts (i.e., environmental justice concerns).

4.2.2 Alternatives

No Action Alternative. Under this alternative, none of the socioeconomic benefits described above would occur. Socioeconomic impacts described in the PAPA EIS would continue because development of Questar's lease area would continue.

Alternative A. Essentially, the positive impacts described for the Proposed Action would be realized for this alternative as well, except that the full benefits would be realized one year later than if Questar is allowed to proceed with the Proposed Action. Under this alternative two rigs would be allowed to operate on a single well pad in the winter 2004-2005, rather than two rigs on each of three well pads in that winter. Over the life of development, however, the difference between the alternative's positive and negative impacts is negligible.

Alternative B. This alternative would continue winter drilling restrictions in Questar's lease area. Under this alternative, Questar would be required to construct the condensate pipeline which would result in additional sales and use tax revenues. However, none of the socioeconomic benefits associated with moderating the current peak summer drilling activities on Questar's leases would occur. Socioeconomic impacts associated with limited seasonal drilling and currently being experienced by local communities would continue.

4.2.3 Cumulative Impacts

Questar's Proposed Action and the alternatives would not result in significant changes to the cumulative impacts described for socioeconomic resources in the PAPA EIS. The benefits are expected to be only locally important. Additional cumulative benefits would occur outside of Sublette County from sales taxes and employment generated by the condensate pipeline.

4.2.4 PAPA ROD Consistency

Potential adverse impacts of seasonally-limited drilling on socioeconomic resources are addressed in the PAPA ROD conditions of approval (COAs). The ROD states "BLM will work with the Operators to plan proposed development operations such that seasonal restrictions do not impact the associated workforce. BLM will work with the Operators to facilitate year round drilling where unnecessary and undue impacts to wildlife or other resources would not occur". Consideration of Questar's Proposed Action is consistent with the ROD COAs.

4.3 Transportation

4.3.1 Proposed Action

Year-round drilling would result in positive impacts to transportation resources (i.e., traffic levels, road conditions, etc.). No adverse impacts to transportation have been identified. Questar has prepared a Transportation Plan to address impacts within their leasehold. A copy of that plan is included as Appendix F of this EA.

Questar's Proposed Action would reduce current and future traffic levels in the PAPA and on area roads. According to Questar estimates, construction of the condensate pipeline and the previously-approved produced water gathering system would eliminate more than 25,000 tanker truck trips annually when Questar's leases are at peak production. Reducing truck traffic would be beneficial to all PAPA resources

and particularly to wildlife, grazing and air quality. In addition, daily tanker truck traffic through Pinedale during operation of the field would be essentially eliminated.

During field development, year-round drilling would also benefit transportation resources in the PAPA by moderating peak summer development activity levels. Currently, Questar is required to conduct drilling and completion activities on their leases between May and mid-November (where crucial winter range occur) or between August and mid-November (where crucial winter range and sage grouse/raptor nesting occur) which results in an intensive level of activity during those months. If Questar's Proposed Action is approved, drilling would occur year-round and peak traffic levels on area roads would be reduced. In addition, during winter drilling Questar has committed to bus workers to drill sites. This would minimize winter traffic in the PAPA.

As part of the Proposed Action, Questar proposes to install telemetry equipment at wells and production facilities. This equipment would allow Questar to remotely monitor and control production equipment using radio signals. Remote control and monitoring should reduce the need for daily well site visits by well operators, further reducing traffic in the PAPA.

Construction of the condensate pipeline is not expected to result in significant impacts to transportation resources and all impacts are expected to be temporary. Construction would comply with permit requirements from State and county regulatory agencies to assure that roads are repaired after construction and that adequate traffic control is implemented to protect the traveling public. Heavily-traveled roads would be bored so that traffic would not be impeded. Shoe-fly (detour) roads would be constructed at appropriate road crossings to prevent disruption of use. Impacts to local transportation from construction of the condensate pipeline would be temporary.

4.3.2 Alternatives

No Action Alternative. Under this alternative, transportation resource impacts described in the PAPA EIS would continue. Only partial benefits from reduced tanker truck traffic would occur. Some reduction in tanker truck traffic would be realized when the previously-approved produced water gathering system is operational. However, condensate would still need to be trucked from each well pad.

Alternatives A and B. Transportation impacts from implementing these alternatives would be identical to those described for the Proposed Action. Both alternatives would require Questar to construct the condensate pipeline so benefits associated with reduced tanker truck traffic would still occur. Impacts associated with construction of the condensate pipeline would similarly occur.

4.3.3 Cumulative Impacts

Implementation of the Proposed Action and alternatives (except the No Action Alternative) would result in less tanker truck traffic on area roads. This reduced traffic volume would result in safer roads for the traveling public. Cumulative impacts described in the PAPA EIS and currently occurring in the vicinity of the PAPA would be reduced.

4.3.4 PAPA ROD Consistency

Questar's Proposed Action and project alternatives are consistent with the PAPA Transportation Plan which provides guidance for transportation planning, road design, construction and road maintenance. The proposal is also consistent with BLM's overall objective of finding ways to effectively reduce peak traffic levels in the PAPA.

4.3.5 Additional Mitigation Opportunities

Further reductions in traffic and benefits to other resources in the PAPA could be achieved if other operators utilized Questar's pipeline to transport condensate from well pads and installed telemetry equipment.

4.4 Land Use and Grazing

4.4.1 Proposed Action

Impacts to grazing and land use from PAPA field development is described in Sections 4.6 and 4.16 of the PAPA EIS. The PAPA EIS anticipated up to 4 well pads/square mile in MAs 4 and 5. If the Proposed Action is implemented, fewer well pads/square mile would be required to completely develop Questar's lease acreage. Questar's proposal to drill up to 20 wells from individual well pads would reduce overall surface disturbance which would benefit grazing and other land uses. The remainder of this section discusses impacts from the condensate pipeline which was not considered in the PAPA EIS.

The condensate pipeline would not preclude current land uses. Because it follows existing pipeline rights-of-way for most of its length, the pipeline is consistent with current land uses. There would be no changes in surface ownership. Installation of the pipeline would not conflict with current zoning regulations.

Construction of the pipeline would temporarily reduce forage in grazing allotments. However, this temporary

loss of grazing land is expected to be insignificant. If the proposed pipeline were constructed, land disturbed by construction would be stripped of vegetation. Although the surface would be available for grazing after construction, re-establishment of vegetation would require time and sufficient precipitation. It is estimated that 54.4 animal unit months (AUMs) would be impacted for the short-term until grasses are re-established after 1 to 3 years. The impacts to grazing would be short-term (1 to 3 years) and would not affect the long-term usability of the grazing allotments.

Questar will not open any more trench than can be successfully backfilled and compacted in a two-day period. Where appropriate, BLM may require portions of the construction right-of-way within 0.25 mile of livestock to be fenced or ramps installed in the trenches. These measures would reduce open trench hazards to livestock and wildlife.

4.4.2 Alternatives

No Action Alternative. Grazing and land use impacts described in the PAPA EIS would continue. Under this alternative, the temporary impacts to grazing described above for the condensate pipeline would not occur.

Under this alternative, Questar would not be allowed to conduct winter drilling. Questar's commitment to drill up to 20 wells from a single well pad is voluntary. According to Questar, year-round drilling makes drilling up to 20 wells from a single pad economically feasible. Seasonally-restricted drilling eliminates the cost savings associated with pad drilling and is economically unattractive. Without winter drilling, Questar would develop the remainder of their productive lease area in the PAPA using the ROD-approved development pattern (up to 4 well pads per section in MAs 4 and 5). More than 9 additional well pads would need to be constructed under this alternative and there would be a concomitant need to install additional roads and pipeline.

Even if Questar were limited to only 9 new well pads and drilling remained seasonally restricted, disturbance associated with this alternative would be greater than the Proposed Action and Alternative A. If drilling is seasonally restricted, the pad size would need to be expanded because Questar would be conducting drilling and completion operations concurrently. Questar would be required to locate the rig away from producing wells on that pad which would require the pad to be expanded because spacing between wells on the pad would need to be increased. According to Questar, if drilling occurs year-round, the offset between the rig and producing wells on the well pad could be reduced. In addition, continuing seasonal restrictions and limiting development to 9 new well pads would delay production (number of wells completed annually and the volume of condensate production would be delayed) to an extent that the overall economic attractiveness of the condensate pipeline would need to be reassessed.

Alternative A. Land use and grazing impacts from implementing this alternative would be identical to those described for the Proposed Action.

Alternative B. Impacts to grazing and land use from implementing this alternative would be greater than those described for the Proposed Action and Alternative A for the reasons described above for the No Action Alternative.

4.4.3 Cumulative Impacts

Questar's voluntary proposal to drill up to 20 wells per well pad would reduce total disturbance (from well pads, roads and pipelines) necessary to complete development of their lease acreage. This reduced disturbance should result in less overall cumulative impacts to land use and grazing in the PAPA.

The condensate pipeline would add to cumulative land use and grazing impacts outside the PAPA. However, the temporary loss of 54 AUMs in grazing allotments crossed by the condensate pipeline represents only a small portion (less than 1 percent) of the AUMs currently available. In addition, the impacts from the pipeline are linear, further reducing the severity of the impact to grazing. Because the condensate pipeline is located adjacent to existing pipelines for most of its length, additional cumulative impacts to land use are expected to be negligible.

4.4.4 PAPA ROD Consistency

The PAPA ROD does not contain COAs specific to grazing and land use although numerous COAs are provided for noxious weed control, reclamation, etc. that directly contribute to the availability of livestock forage in the PAPA. Consistency with these COAs are described in Sections 4.11 and 4.12.

4.4.5 Additional Mitigation Opportunities

BLM, Questar and WGFD could involve grazing permittees and the Wyoming Department of Agriculture in developing mitigation strategies elsewhere in Questar's lease area to address grazing concerns raised during scoping.

4.5 Recreation Resources

4.5.1 Proposed Action

Questar's Proposed Action is not expected to change recreation resource impacts described in Section 4.7 of the PAPA EIS. Only dispersed recreation resources occur along the condensate pipeline right-of-way. There may be some limited displacement of recreation use on BLM-managed lands during construction. However, the impact is expected to be insignificant and temporary. Using HDD to cross the Green River would eliminate adverse impacts to water quality from an open cut that could impair trout fishing downriver (see also Section 4.10 for a discussion of potential impacts from HDD to water quality).

4.5.2 Alternatives

No Action Alternative. Recreation impacts described in the PAPA EIS would continue. Under this alternative, impacts to recreation resources described above for the condensate pipeline would not occur.

Alternatives A and B. Recreation impacts from implementing these alternatives would be identical to those described above for the Proposed Action.

4.5.3 Cumulative Impacts

Within the PAPA, implementation of the Proposed Action and alternatives would result in the same cumulative impacts described in the PAPA EIS. The condensate pipeline would result in additional cumulative impacts to recreation outside the PAPA (i.e., temporary loss of dispersed recreation on Federal lands in the vicinity of construction activities). However, it is anticipated that the additional cumulative impacts would be short-term and negligible.

4.5.4 PAPA ROD Consistency

The PAPA ROD does not contain administrative requirements or COAs specific to recreation resources.

4.6 Visual Resources

4.6.1 Proposed Action

If year-round drilling is permitted, drilling rigs may be visible in the winter from key viewpoints. BLM would implement mitigation procedures outlined in Section 3 of the PAPA ROD to minimize the visual impacts of winter drilling (see Section 4.6.4 below). Winter drilling would, according to Questar, reduce the time needed to completely develop their lease acreage from 18 to 9 years which would also shorten the period associated with visual perturbations from drilling rigs.

Construction of the condensate pipeline, in conjunction with the previously-approved produced water gathering system, would reduce current and future visual impacts in Questar's lease area. Currently, condensate and produced water is stored at each well site in tanks. These tanks are the most visible feature of producing well pads and are noticeable from long distances. The pipelines eliminate the need to store condensate and produced water at each well pad which would reduce the visibility and visual impacts of producing well pads. In addition, by constructing only 9 additional well pads in their lease acreage, Questar's proposal would concentrate disturbance to the landscape which would reduce the intensity of development evident in PAPA. Finally, reducing tanker truck traffic would reduce visibility and visual impacts from traffic currently evident in the PAPA.

The condensate pipeline would be consistent with BLM's VRM objectives. The proposed condensate pipeline crosses approximately 7.5 miles of VRM Class II at the New Fork and Green rivers. The objectives of the VRM classification would be maintained at both locations. Construction and operation would not significantly change the existing character of the landscape and should not attract attention following re-establishment of vegetation.

The pipeline would cross the New Fork River using HDD rather than open cut techniques which would reduce visual impacts by eliminating the need for extensive streambank grading and restoration. No significant surface facilities or modifications of topography (i.e., extensive cuts and fills) are proposed that would change the existing character of the crossing area. The crossing area is adjacent to existing pipelines.

The condensate pipeline alignment across the Green River is adjacent to existing pipelines. An automated valve is proposed within the VRM Class II area associated with the Green River crossing in the SE of Section 7, T. 23 N., R. 111 W. The valve will be housed in a 4 x 8 x 7-foot tall building within a 20 x 30-foot fenced and graveled site. The building, as with all other surface facilities, will be painted a non-contrasting color harmonious with the surrounding landscape (Carlsbad Canyon (2.5Y 6/2 or other visually acceptable color specified by the Authorized Officer). The Green River would be crossed using HDD which would reduce visual impacts by eliminating the need for extensive streambank grading and restoration.

Approximately 9.4 miles of the proposed pipeline would cross areas designated as VRM Class III near

the river crossings. The existing character of the landscape would be retained following right-of-way restoration. Pipeline construction and operation in this VRM class would be consistent with the objective to partially retain the existing character of the landscape. The activity may draw the attention of the casual observer, but should not dominate the landscape.

The remaining 90.5 miles would cross VRM Class IV landscapes that allow for major modifications of the existing character of the landscape. Construction and operation of the proposed pipeline is consistent with VRM Class IV objectives.

4.6.2 Alternatives

No Action Alternative. Under this alternative, impacts to visual resources described above for the condensate pipeline would not occur. Visual impacts within the PAPA would be greater than for the Proposed Action and Alternative A. More well pads would be required under this alternative to completely develop Questar's lease acreage than under the Proposed Action or Alternative A (see Section 4.4.2). Visual impacts in Questar's lease area would not be reduced because condensate storage tanks at each well site would still be required and tanker truck traffic would only be partially reduced.

Alternative A. Visual impacts and benefits from implementing this alternative would be identical to those described for the Proposed Action. However, impacts and benefits would be delayed one year.

Alternative B. Year-round visual impacts from drilling in Questar's lease area would be eliminated by this alternative. However, this alternative would require more well pads than the Proposed Action or Alterative A (see Section 4.4.2). Visual impacts from the condensate pipeline would still occur. Visual impacts from implementing this alternative would be greater than the Proposed Action or Alternative A.

4.6.3 Cumulative Impacts

In the PAPA, implementation of the Proposed Action and Alternative A would result in a reduction of cumulative impacts to visual resources described in the PAPA EIS. Implementation of Alternative B and the No Action Alternative would result in essentially the same impacts in the PAPA as described in the PAPA EIS. Construction of the condensate pipeline would add additional cumulative impacts to visual resources outside the PAPA. The additional cumulative impacts are expected to be short-term but noticeable until restoration is complete. However, because the impacts will occur primarily adjacent to existing pipelines, in the long-term the impacts are expected to blend with the adjacent landscape.

4.6.4 PAPA ROD Consistency

The PAPA ROD specifically addresses visual impacts through COAs in Section 3 and MA restrictions and limitations in Section 4. Questar proposes to construct 3 well pads in MA 4 (Sensitive Viewshed MA) and the PAPA ROD placed limitations and restrictions on development within this MA. These limitations and restrictions are summarized on Table 2-1. Questar's proposal would comply with the ROD limitations and restrictions placed on MA 4. The ROD allowed 28 well pads to be developed in the MA. To date, 7 well pads have been constructed in this MA, bringing the total number of existing plus new well pads in the MA to 10. The ROD also limits the number of well pads/square mile to 4 unless it can be demonstrated that additional well pads and production facilities will not unduly result in short- or long-term impacts to the viewshed. Questar's proposal would also comply with this restriction.

The ROD identified an area of the Mesa as particularly sensitive to visual impacts. This area is shown as "No New Roads" on Figure 2-2. The ROD stated that this area was to be generally avoided by surface disturbing activities. Questar's proposal complies with the "No New Roads" restriction. Questar's proposal does not affect the Breaks, which are identified as MA 2.

For each APD in MA 4, BLM will require Questar to prepare a visual resource mitigation plan. Using criteria established in the ROD, during site-specific review of Questar's facilities BLM will require that production facilities and road and pipeline disturbance that could degrade the visual quality of the landscape be screened or otherwise mitigated to minimize visual impacts in this MA.

Section 3 of the ROD contains COAs designed to reduce impacts from night lighting of drilling rigs and operating facilities. BLM will impose conditions on Questar's APDs to minimize the effects of drilling rig lighting on adjacent residences consistent with the COAs.

4.7 Cultural and Historic Resources

4.7.1 Proposed Action

In the PAPA, impacts from year-round drilling would be the same as those described in Section 4.9 of the PAPA EIS. However, the condensate pipeline would represent additional impacts to cultural and historical resources that were not addressed in the PAPA EIS. Thirty-five cultural resource sites recommended as eligible for nomination to the NRHP, and present in the proposed pipeline right-of-way, would be affected by construction of the pipeline. However, all but three crossings of eligible sites occur in portions of eligible

sites that do not contribute to their eligibility status (Pastor, 2004). The Advisory Council's guidelines for Section 106 compliance state that a crossing of a non-contributing portion of a site results in a determination of no adverse effect.

Construction of the pipeline across the Slate Creek Cutoff/Baker Davis Road and East Bank Kinney Cutoff would result in the loss of trail ruts from clearing and blading of the right-of-way. The proposed pipeline crosses both trails at points considered to be contributing to eligibility for nomination to the NHRP; however, the setting for both trail segments at the proposed pipeline crossings are compromised by past and/or ongoing disturbances.

The impacts anticipated at each of the eight historic trail crossings are discussed by trail below.

Oregon Trail. The pipeline would cross the Oregon Trail in Section 10, T. 18 N., R. 112 W. on land administered by the BLM. This area has been previously disturbed. The pipeline would be installed using conventional ditching methods and would parallel the east edge of an existing pipeline right-of-way. Twenty eight feet of new disturbance would be created across the trail. No additional work space is needed and no fencing is proposed.

Black Fork Cutoff. The Black Fork Cutoff crossing would occur in Section 27, T. 19 N., R. 112 W. The crossing location is privately-owned. The pipeline would be installed using conventional ditching methods in an area where no contributing segment of trail is visible. Approximately 25 feet of new disturbance would be created across the trail parallel to other pipelines. No additional work space is needed and no fencing is proposed.

Hams Fork Cutoff. The pipeline would cross the Hams Fork Cutoff in Section 10, T. 19 N., R. 112 W. on privately-owned lands. This portion of the trail has been destroyed by the Oregon Short Line Railroad line. Questar would bore underneath the railroad tracks to install the pipeline. A staging area for this bore would be needed approximately 150 feet from the railroad right-of-way.

West Bank Kinney Cutoff The West Bank Kinney Cutoff, in Section 13, T. 23 N., R, 112 W., would be crossed on lands administered by the BLM. No physical evidence of the trail exists in this area. The condensate pipeline would cross the trail just south of an established right-of-way for several Exxon water lines. The pipeline would be constructed parallel to the existing water lines but with an undisturbed buffer between them. Fifty feet of new disturbance would be created across the trail. The pipeline would be installed using conventional ditching methods. No additional work space is needed and no fencing is proposed.

Slate Creek Cutoff/Baker Davis Road. The condensate pipeline would cross the Slate Creek Cutoff and Baker-Davis Road in Section 32, T. 24 N., R. 111 W. on lands administered by the BOR. This portion of the trail is immediately adjacent to the Lincoln/Sweetwater County Road and also appears to have been used for a previously installed east/west pipeline. The proposed pipeline would be installed using conventional ditching methods. This segment of the proposed pipeline does not parallel an existing right-of-way. Fifty feet of new disturbance would be created across the trail. No additional work space is needed and no fencing is proposed.

East Bank Kinney Cutoff. The East Bank Kinney Cutoff would be crossed in Section 32, T. 24 N., R. 111 W. on lands administered by the BOR. This portion of the trail is immediately adjacent to the Lincoln/Sweetwater County Line Road. The pipeline would be installed using conventional ditching methods. This segment of the pipeline would be located to the west of another pipeline right-of-way. Fifty feet of new disturbance would be created across the trail. No additional work space is needed and no fencing is proposed. Access to the pipeline would be from the Lincoln/Sweetwater County Line Road.

Sublette Cutoff. The pipeline would cross the Sublette Cutoff in Section 9, T. 26 N., R. 111 W. on lands administered by the BLM. This portion of the trail is being utilized as an access road and the trail no longer exists at the condensate pipeline crossing point. The pipeline would be installed using conventional ditching methods and will cross the trail on the west side of the Lincoln/Sweetwater County Line Road. Approximately 25 feet of new disturbance would be created in this area on the west side of the adjacent pipeline right-of-way. A shoe-fly would be constructed on the south side of the road/trail to prevent traffic disruption.

Lander Cutoff. The Lander Cutoff would be crossed in Section 29, T. 31 N., R. 108 W. on lands administered by the BLM. The pipeline would cross within existing disturbance created by previous pipeline construction. No new disturbance would be created. Questar would fence the adjacent areas of the trail during construction to prevent disturbance of contributing segments of the trail.

According to a BLM-established Maintenance Action covering this area, the setting of all but two of the historic trails crossed by the condensate pipeline has been compromised. Consequently, six of the eight trail segments do not contribute to the eligibility of the affected trails in this area. Impacts from pipeline

construction across the two contributing trail segments, the Slate Creek Cutoff/Baker Davis Road and East Bank Kinney Cutoff, would be mitigated by reestablishing contours and best approximations of the original conditions of the affected trail ruts; narrowing right-of-way disturbance to the extent possible without compromising safety; and minimizing the length of damage to the affected rutted trail. Interpretive signs or trail markers would be erected to facilitate the awareness of historic cultural resources in the area.

The pipeline would also cross archeological investigation site 48SU262. At site 48SU262, data recovery would be completed if warranted based on findings during open trench inspection. The pipeline would cross 4 prehistoric camps that will require specific mitigation. At sites 48LN115 and 48SU2615, Questar would be required to reduce the right-of-way width and fence the contributing portions of the site to prevent disturbance. At site 48LN1188, Questar would be required to fence an adjacent staging area.

With the application of mitigation measures identified above, there would be no significant impacts on any historic properties. No impacts to traditional cultural properties are anticipated due to the absence of identified Native American tribal concerns along the condensate pipeline route.

4.7.2 Alternatives

No Action Alternative. Under this alternative, potential impacts to subsurface historic properties and historic trails would not occur during construction of the condensate pipeline. Cultural and historic resource impacts described in the PAPA EIS from field development would continue within the PAPA.

Alternatives A and B. Impacts from implementing these alternatives would be identical to those described above for the Proposed Action.

4.7.3 Cumulative Impacts

Within the PAPA, implementation of the Proposed Action and alternatives would result in the same cumulative impacts described in the PAPA EIS. Because the trail segments crossed by the condensate pipeline do not contribute to trail eligibility, there would be no additional unmitigated cumulative impacts on any historic properties.

4.7.4 PAPA ROD Consistency

Consistent with the PAPA ROD COAs, the BLM and the State Historic Preservation Officer are developing a Programmatic Agreement (PA) which will include discovery plans and individual project treatment plans for field development activities. BLM will evaluate potential impacts to cultural and historic resources consistent with the PA.

4.7.5 Additional Mitigation Opportunities

To avoid disturbance to the surface of the Slate Creek Cutoff/Baker Davis Road and East Bank Kinney Cutoff trails, Questar could consider boring the crossings instead of crossing using an open cut. This crossing technique may require increased right-of-way width on both sides of the trail and between the trails to accommodate bore pits. The bore would avoid all disturbance to the surface of the trail, including the ruts.

Another alternative crossing method that would avoid disturbance to the surface of the trails is a relatively short (1,000 foot) HDD. The disadvantage of using HDD over boring is cost and the need for relatively large staging areas at the entry and exit points which, depending on their location, could result in additional impacts to the trail setting.

4.8 Minerals, Geology and Geologic Hazards

4.8.1 Proposed Action

Implementation of Questar's Proposed Action should improve and expedite production for Questar's lease area. The Wyoming Oil and Gas Conservation Commission (WOGCC) recently reviewed the benefits of Questar's Proposed Action in response to Docket # 332-2004. The WOGCC stated the following benefits to production, operating efficiencies and workforce safety:

- Closer well spacing at the surface which reduces the number of roads and traffic;
- Minimizes "add-ons" to existing locations;
- Well pad size can be reduced;
- Surface disturbance can be restored sooner with less repeated disturbance;
- Pits will be used once and then closed rather than modified and left open to use for multiple years;
- Flareless completions should reduce overall project emissions;
- Reduces use of carbon dioxide or nitrogen during well fracing;
- Minimizes risk of sticking pipe while cleaning out frac sand or plug debris across relatively under pressured zones;
- Helps prevention of waste and protection of correlative rights (Wyoming Conservation Law);
- Allows the drainage of all penetrated and completed sands of various sizes and configurations equally;
- Minimizes the loss of production and reserves to offset wells drilled before the current well because

all wells are drilled at the same time in the immediate area;

- Improves the economics of individual locations, making best management practices economically viable;
- Significantly reduces the impact on existing locations and production;
- Avoids shutting in production, rigging down and moving production facilities (lines, tanks, etc.) and restarting wells; reduces time and cost ($200,000) for each Move In/Rig Up (MIRU) operation;
- Minimizes road traffic and the need to move the drilling rigs in and out;
- Lessens the time spent drilling each well;
- Minimizes vertical [well bore] section, lowers directional cost and reduces chances of sticking pipe/sidetracking;
- All gas line connections can be made at once without repeated disturbances;
- Minimizes risk of drilling through zones with altered pressure profiles (depleted by offset wells);
- Reduces risk of stuck pipe and or well control problems;
- Minimizes chances of needing an extra casing string to separate different pressure regimes;
- Provides for better bit knowledge and performance, better anticipation of required mud weights, retained knowledge (same rig, crews, engineers);
- Lessens the chance for lost circulation and blowouts and personnel injuries;
- Maximizes economics of using self skidding and umbilical system rigs;
- Less traffic on area roadways. The rig and equipment stay until all wells on the location are drilled.

Impacts to other minerals in the PAPA and geologic hazards are discussed in Section 4.11 of the PAPA EIS.

The condensate pipeline would have no adverse impacts on mineral resources. Construction activities would not precipitate seismic activity because there are no active faults in the immediate area, and there would be only minor intrusion into bedrock. Excavation for the pipeline would occur below the alluvial surface in some locations along the route; however, the fractured nature of the bedrock would likely allow excavation without blasting. The terrain along the pipeline route shows local variations in elevation, but because the slope is generally low, it is not physically predisposed to the occurrence of landslides that could be exacerbated by precipitation on surfaces exposed or denuded as a result of construction activities. The slope rating indicates that the surface along the route is suitable for surface and deep mechanical site preparations (Halasz *et al*., 2000).

There would be no impacts to the availability of locatable or salable minerals from the pipeline because there are no known occurrences of those resources along the route. Access to potentially-available oil and gas resources along the pipeline route would not be restricted.

4.8.2 Alternatives

No Action Alternative. This alternative would eliminate the numerous benefits to production summarized by the WOGCC in Section 4.8.1. Development of the PAPA would continue without winter drilling in Questar's lease area. Negligible impacts from the condensate pipeline would not occur.

Alternative A. Impacts from implementing this alternative would be identical to those described for the Proposed Action. However, operating efficiencies would be delayed one year.

Alternative B. Impacts from this alternative would be the same as described for the Proposed Action because Questar would still be required to construct the condensate pipeline. However, benefits and efficiencies summarized by the WOGCC drilling would not be realized because Questar would drill additional wells in the PAPA utilizing the PAPA ROD development pattern.

4.8.3 Cumulative Impacts

Cumulative impacts to mineral resources would be the same as those described in the PAPA EIS.

4.8.4 PAPA ROD Consistency

Specific COAs are not provided in the PAPA ROD for mineral resources.

4.9 Paleontology

4.9.1 Proposed Action

Impacts to paleontological resources are discussed in Section 4.12 of the PAPA EIS. In the PAPA, implementation of year-round drilling would not result in impacts different from those discussed in the EIS.

Construction of the condensate pipeline would, in some areas, disturb unconsolidated bedrock as trenching occurs in the relatively shallow soils and would have the potential to damage undiscovered, scientifically-significant fossils. Construction could also result in the discovery of fossils that add to the understanding of paleontological resources in southwestern Wyoming.

Questar would inform workers about the legal requirements of disturbing paleontological resources and procedures if fossils are uncovered. If paleontological resources are uncovered, construction activities would be suspended to prevent further disturbance and Questar would immediately contact the BLM who would arrange for a determination of significance and, if necessary, recommend a recovery or avoidance plan. Mitigation of paleontological resources would occur on a case-by-case basis, and Questar would be responsible for the costs. Increased public access to the construction sites may increase opportunities for unauthorized fossil collection.

4.9.2 Alternatives

No Action Alternative. This alternative would eliminate the potential for impacts to paleontological resources from construction of the condensate pipeline. However, potential impacts within the PAPA from field development would continue.

Alternatives A and B. Impacts from implementing these alternatives would be identical to those described for the Proposed Action.

4.9.3 Cumulative Impacts

Within the PAPA, implementation of the Proposed Action and alternatives would result in the same cumulative impacts described in the PAPA EIS. Construction of the condensate pipeline would result in the potential for additional cumulative impacts and benefits outside the PAPA (i.e., damage or discovery of fossils). However, these impacts are expected to negligible.

4.9.4 PAPA ROD Consistency

Consistent with the ROD, the BLM would impose standard practices to protect paleontological resources. To avoid unnecessary and undue impacts to the paleontology resource, Questar would be required to inform workers of the potential for encountering fossils and what steps to take if they do. Workers will also be informed that it is illegal to remove any vertebrate fossil from public lands without a permit.

4.10 Water Resources

4.10.1 Proposed Action

Impacts to water resources are described in Section 4.13 of the PAPA EIS. Because of reduced disturbance from extensive pad drilling in the PAPA, implementation of the Proposed Action is expected to result in less impacts to water resources than those described in the PAPA EIS. Some have suggested that winter drilling will result in exacerbated water quality degradation from runoff. It is important to recognize that winter drilling is currently allowed over much of the PAPA – it is excluded only on winter ranges and sage grouse breeding and nesting habitats. The PAPA ROD contains specific mitigation guidelines and standard practices to protect surface and ground water. Those practices will be applied to development activities within Questar's lease area regardless of the time of year that development occurs. In addition, Questar proposes to complete development of its potentially-productive acreage by constructing only 9 additional well pads. Up to 20 wells would be drilled per well pad from some of the new and existing well pads. Overall surface disturbance would be reduced on Questar's lease acreage which should reduce the potential for water quality degradation.

Potential impacts to water resources from construction of the condensate pipeline would be limited to surface waters. The depth to ground water along the entire pipeline route would preclude adverse effects from pipeline construction and operations. There would be no impacts to water wells. Potential impacts to surface waters could include short-term increased turbidity, salinity and sedimentation of the surface waters during seasonal flows or precipitation events due to runoff and erosion from disturbed upland areas, and depletion of Green River tributary waters for construction and hydrostatic testing.

Clearing and blading followed by construction vehicle travel across ephemeral stream channels could break down banks, increase sediment load, cause or accelerate erosion, and destabilize the channel. However, vehicle access to the pipeline right-of-way would be confined to existing access roads and to the construction right-of-way. No new roads would be constructed. If vehicles were operated when soils were saturated, ruts could form that could increase erosion. However, Questar has committed to avoiding vehicle travel during saturated soil conditions to avoid impacts that could be caused by rutting.

Using conventional crossing techniques (i.e., open cut) for the Blacks Fork, Hams Fork, Green and New Fork rivers would cause an increase in sedimentation from river bank erosion and streambed excavation. To prevent this impact, the pipeline would be installed using HDD beneath the rivers. Potential adverse impacts to the floodplains of the Blacks Fork, Hams Fork, Green and New Fork rivers would be reduced.

Accidental leaks from the pipeline could impact surface water quality. The principal risks of pipeline operations include excessive pressure, physical damage through flooding or soil erosion and corrosion.

Pipeline failures due to excess pressure would be prevented through engineering design and relief valves which dissipate excessive pressures. The pipeline would be monitored through periodic leakage surveys and patrols to anticipate and correct problems before failures occur.

Approximately 0.83, 1.24 and 0.78 acre-feet of water would be withdrawn from the Hams Fork, Green and New Fork rivers, respectively, for hydrostatic testing after pipeline installation is complete. Permits or license agreements for water withdrawal would be obtained from the State. The terms of the permit would ensure that the quantity used for testing would not harm other uses. Since discharge operations would also be permitted through the State, permit conditions would ensure the discharged water would not damage soils or surface waters at the point of discharge. The test water would be tested and treated, if necessary, to ensure that it meets Federal and State water quality standards and permit conditions prior to its release.

4.10.2 Alternatives

No Action Alternative. Under this alternative, water resource impacts described in the PAPA EIS from drilling and completion would continue. This alternative would result in greater surface disturbance than the Proposed Action or Alternative A. Consequently, potential water quality degradation would increase under this alternative. However, impacts from construction of the condensate pipeline would not occur.

Alternative A. Impacts from implementing this alternative would be identical to those described for the Proposed Action.

Alternative B. This alternative would require more disturbance than the Proposed Action or Alterative A to develop remaining reserves in Questar's lease area (see Section 4.4.2). Potential impacts to water resources from implementing this alternative would be greater than the Proposed Action or Alternative A as a result of additional disturbance.

4.10.3 Cumulative Impacts

Within the PAPA, implementation of the Proposed Action and Alternative A would result in less cumulative impacts to water resources than described in the PAPA EIS. Alternative B and the No Action Alternative would result in the same level of cumulative impacts as described in the PAPA EIS. There could be additional cumulative water quality impacts (i.e., sedimentation) from construction of the condensate pipeline outside the PAPA. However, BLM and the State of Wyoming have developed Best Management Practices to reduce off-site water quality degradation and Questar proposes to HDD the larger river crossings. These practices would result in only insignificant and short-term water quality impacts.

4.10.4 PAPA ROD Consistency

The PAPA ROD contains specific mitigation guidelines and standard practices to protect surface and ground water. All reserve pits would be lined (unless an exception is granted) to avoid migration of pit fluids beyond the pit. BLM would encourage Questar to haul fluids from one pit to the other as much as is practical, instead of using additional ground water for each well. The goals are to reduce the amount of fluids needing to be disposed of and to conserve freshwater. BLM may, on a case-by-case basis, require that fracturing flow back fluids be contained in tanks and disposed of in an approved off-site location if unacceptable impacts would occur if it were disposed of in the reserve pit. In any case, all fracturing fluids and condensate fluids will be contained in the reserve pit and not allowed in flare pits or the surrounding area, to prevent unnecessary impacts on vegetation and soils. By implementing these practices, Questar's Proposed Action and alternatives would be consistent with water resource protection COAs found in the PAPA ROD.

4.10.5 Additional Mitigation Opportunities

Questar's proposal to HDD the river crossings will reduce water quality-related impacts. HDD is a technique that is being used more frequently to avoid impacts to sensitive aquatic habitats. However, there is risk in using HDD to cross rivers. Although infrequent, the technique can result in "frac-outs". A frac-out occurs when there are conveyances between the borehole under the river and the river bottom which allows drilling mud (which is under pressure) to escape the borehole. The result is a release of drilling mud into the river water column. To minimize the adverse consequences of a frac-out, it is recommended that Questar develop an agency-approved monitoring and contingency plan for each of the river crossings. The goal of that plan should be to outline what steps Questar's contractor would take in the event of a frac-out (such as reducing drilling fluid pressure and implementing best management practices) and what types of monitoring are necessary to detect and correct problems. The plan should also provide a contingency plan for crossing each river should it not be feasible to complete the HDD crossing.

It is also recommended that HDD drilling fluids not contain additives that could be toxic to aquatic life. Also, Questar should be required to avoid the use of mud pits at the drilling sites to reduce disturbance and to facilitate clean up and restoration. Tanks should be used for mud storage.

4.11 Soils

4.11.1 Proposed Action

Impacts to soils from development activities in the PAPA are described in Section 4.14 of the EIS. As was discussed above for water resources, there has been some concern that drilling in the winter could exacerbate soils damage. It is important to recognize that winter drilling is currently allowed over much of the PAPA – it is excluded only on winter ranges and sage grouse breeding and nesting habitats. The PAPA ROD contains specific mitigation guidelines and standard practices to protect soils. Those practices will be applied to activities in Questar's lease area regardless of the time of year that development occurs.

Overall, it is anticipated that implementation of the Proposed Action would result in less soil disturbance than discussed in the PAPA EIS. By drilling up to 20 wells from a single well pad and constructing fewer roads and pipelines, Questar would reduce disturbance to soil in their lease area.

Construction of the condensate pipeline will disturb approximately 755 acres. Soil impacts are expected to be temporary. There would be some loss of soils due to the physical alteration of the existing soil profile. However, there are no large steep areas along the route where development would result in slumping or landslides.

Soil exposure to erosion would be increased during construction of the condensate pipeline after vegetation is stripped and topsoil is bladed into windrowed stockpiles within the construction right-of-way. Windrowed topsoil and exposed subsoils would be subject to accelerated water and wind erosion due to loss of protective vegetative cover, higher runoff rates, lower infiltration rates and more direct exposure to wind. The temporary placement of topsoil and excavated subsoil into separate windrowed stockpiles for the duration of construction would prevent soil mixing and would allow for restoration of the soil profile and optimization for re-establishment of productive soil conditions and vegetative cover following trench backfilling.

Soil compaction from vehicular traffic could result in reduced soil productivity due to loss of soil structure, increased erodibility and decreased infiltration and water storage capacity. Increased soil erosion can potentially increase sediment yield, turbidity and salinity to drainages. All equipment and vehicular access would be confined to existing roads and the established right-of-way, thereby avoiding soil compaction on undisturbed areas. Questar has committed to avoiding vehicle travel during saturated soil conditions to avoid impacts that could be caused by rutting.

4.11.2 Alternatives

No Action Alternative. Under this alternative, soil impacts described in the PAPA EIS from drilling and completion would continue. Soil impacts would be greater than those described for the Proposed Action and Alternative A because more than 9 addition well pads (and roads and pipelines) would be required to develop remaining reserves in Questar's lease area. However, soil impacts from disturbing 755 acres during construction of the condensate pipeline would not occur.

Alternative A. Impacts from implementing this alternative would be identical to those described for the Proposed Action.

Alternative B. This alternative would require more disturbance than the Proposed Action or Alterative A to completely develop productive reserves in Questar's lease area (see Section 4.4.2). Potential impacts to soils from implementing this alternative would be greater than the Proposed Action or Alternative A as a result of additional disturbance.

4.11.3 Cumulative Impacts

In the PAPA, implementation of the Proposed Action and Alternative A would result in less cumulative impact to soils than described in the PAPA EIS because disturbance necessary to complete development of Questar's lease area would be reduced. Under the No Action Alternative and Alternative B, cumulative impacts within the PAPA would be the same as those described in the PAPA EIS.

Additional cumulative impacts to soils would occur from construction of the condensate pipeline outside the PAPA. However, impacts to soils from construction of the condensate pipeline are expected to be short-term.

4.11.4 PAPA ROD Consistency

The PAPA ROD contains specific mitigation guidelines and standard practices to protect soils and provide for proper reclamation regardless of the alternative selected by BLM. Surface disturbance will be kept to a minimum. Erodible or hard to revegetate soils would not be disturbed any more than absolutely necessary.

Project-related travel will be restricted to constructed, surfaced roads when soils are saturated and rutting could occur to avoid compacting the soil and accelerating soil erosion. Sandy soils would be

avoided. These soils are highly erosive, difficult to revegetate, could contain buried cultural material, and support tall sage brush which is important sage grouse wintering habitat.

4.12 Vegetation and Noxious Weeds

4.12.1 Proposed Action

Impacts from field development on vegetation is described in Section 4.15 of the PAPA EIS. Year-round drilling would result in less impacts than those disclosed in the PAPA EIS (see Section 4.4.2).

For the condensate pipeline, impacts to vegetation are evaluated with respect to long-term vegetation productivity and permanent changes in species composition. Construction of the proposed pipeline would temporarily disturb approximately 755 acres. Disturbed areas would consist of either direct removal of vegetation from blading, grading and trenching or damage from vehicles and foot traffic on the right-of-way. Invasive, noxious weed species could infest disturbed areas should seeds or cuttings of some species be transported naturally or accidentally to the disturbed areas.

All disturbed areas would, however, be reclaimed and revegetated soon after construction is complete and in accordance with agency or landowner requirements. Appropriate seed mixtures would be used to promote establishment of grasses in the short-term while the shrubs would become established over a longer period of time. Grasses could require 2 to 3 years for successful re-establishment in the area's arid environment. The shrub component may require more than 20 years for recovery to pre-disturbance levels after reseeding and reclamation. Long-term productivity of shrubs would be adversely affected within the right-of-way and construction areas. Long-term productivity of grasses would not be affected.

Weedy species often thrive on disturbed sites such as roads and well pads and out-compete more desirable plant species. Increased weed infestation may render a site less productive as a source of forage for wildlife and livestock. Although some weed infestation may be anticipated on the proposed pipeline right-of-way, the application of weed preventative and control measures discussed in Chapter 2 would minimize impacts from weed species. The overall impacts to vegetative resources would, therefore, be minimal.

4.12.2 Alternatives

No Action Alternative. There would be no vegetation disturbance from the condensate pipeline under this alternative. However, vegetation disturbance would continue on Questar's lease area. Vegetation disturbance in the lease area would be greater than under the Proposed Action and Alternative A because Questar would be required to construct more well pads, road and pipelines to recover remaining reserves in their lease area.

Alternative A. Impacts from implementing this alternative would be identical to those described for the Proposed Action.

Alternative B. This alternative would require more disturbance than the Proposed Action or Alterative A to completely develop productive reserves in Questar's lease area (see Section 4.4.2). Potential impacts to vegetation from implementing this alternative would be greater than the Proposed Action or Alternative A as a result of additional disturbance.

4.12.3 Cumulative Impacts

Within the PAPA, implementation of the Proposed Action and Alternative A would reduce cumulative impacts to vegetation described in the PAPA EIS. Alternative B and the No Action Alternative would result in the same level of vegetation impact as described in the PAPA EIS.

The condensate pipeline would add cumulative impacts to vegetation outside of the PAPA. However, the additional cumulative impacts from 755 acres of vegetation disturbance are expected to be negligible and short-term.

4.12.4 PAPA ROD Consistency

The PAPA ROD contains a number of specific mitigation guidelines and standard practices to ensure proper reclamation regardless of the alternative selected by BLM. Surface disturbance will be kept to a minimum. Erodible or hard to revegetate soils would not be disturbed any more than absolutely necessary.

In the lease area, Questar and BLM will conduct inspections of revegetation efforts after the second and fourth growing seasons to evaluate success. The need to reseed, fertilize or spot treat will be determined. Successful revegetation will be based on the ability of the vegetation to stabilize reclaimed sites and to provide livestock and wildlife forage. If reseeding is judged to be necessary, based on vegetation density and composition of adjacent areas, the erosion control, revegetation and restoration plan(s) would be reviewed for any necessary changes to improve revegetation success.

In accordance with Executive Order 13112, if invasive or non-native species infest disturbed sites, they will be controlled by mechanical, chemical, biological or other methods which are approved by BLM and the

local weed control agency. Herbicide use will be avoided in all areas near water and special status plant populations. Questar would be required to submit a pesticide use permit (PUP) to the BLM AO before applying pesticides on Federal lands.

Vehicular traffic will be limited to the running surface of roads and well pads as authorized in APDs. This is required to prevent undue impacts to vegetation and avoid soil compaction and accelerated erosion.

4.13 Wetland and Riparian Resources

4.13.1 Proposed Action

Year-round drilling would not impact areas identified as wetlands or riparian areas. Wetlands and riparian areas associated with pipeline crossings of the Hams Fork and New Fork rivers would be completed in such a way as to avoid direct impacts and to allow the wetlands/riparian area to continue to function. The use of HDD would allow the pipeline to be constructed beneath these environmentally sensitive areas in order to avoid surface disturbance to riparian areas. In addition, Questar would obtain permits required to complete pipeline construction in these areas. Section 404 of the Clean Water Act (including Nationwide Permit 12 permit conditions) require adequate measures to be taken to protect these resources. There would be no loss of wetlands/wetland function or riparian areas/riparian area functionality or impacts to existing wetlands/riparian areas.

4.13.2 Alternatives

No loss of wetlands, wetland function, riparian areas or riparian functionality would occur under any of the alternatives.

4.13.3 Cumulative Impacts

Implementation of the Proposed Action and alternatives would result in the same cumulative impacts described in the PAPA EIS.

4.14 Threatened and Endangered Species and Special Status Species

Effects to listed threatened and endangered species and special status species by natural gas development on the PAPA and the gas sales pipeline were addressed in Section 4.18 of the PAPA EIS. The listed species considered in this EA include those that were addressed in the PAPA EIS (black-footed ferret, whooping crane, bald eagle, Ute ladies'-tresses, four species of Colorado River fish) as well as gray wolf, grizzly bear and Canada lynx. Currently, yellow-billed cuckoo is a candidate species, greater sage grouse and pygmy rabbits have been petitioned for listing under ESA. Other candidate and special status species that were addressed in the PAPA EIS are considered here, primarily with respect to potential effects by construction of the condensate pipeline.

4.14.1 Proposed Action

Effects to listed species and special status species by the various components of the Proposed Action are addressed if there is some potential for effect, either adverse or beneficial. There are some components that can be addressed; the condensate pipeline, installation of telemetry equipment, and bussing crews to and from year-round drilling sites. Other components, including flareless completions, continuation and expansion of the Sublette Mule Deer Study Phase II, consultation with WGFD for future well pad siting, and funding habitat enhancement projects either don't apply to listed and special status species or effects can not be evaluated without specific information on location and nature of the component (habitat enhancement projects).

The PAPA EIS anticipated up to 4 well pads per square mile in MA 4 and 5. If the Proposed Action is implemented, the well pad density on Questar's lease area would be less than that. Overall, reduced surface disturbance translates as reduced direct impacts to habitats potentially used by some of the threatened, endangered and special status species discussed in this section.

4.14.1.1 Listed Species

Black-footed Ferret. There will be no adverse effects to black-footed ferrets by Questar's proposed year-round drilling. There are no white-tailed prairie dog colonies within Questar's lease area. Questar and BLM would comply with requirements identified by the FWS's concurrence with BLM's determination for the PAPA EIS that project activities were not likely to adversely affect black-footed ferrets. That concurrence was based on mitigative measures provided in the PAPA EIS ROD including:

- Examining construction sites prior to surface disturbance for presence of prairie dog colonies;
- Avoid disturbance to prairie dog colonies that meet criteria as suitable habitat for black-footed ferrets;
- If colonies can not be avoided, conduct surveys for black-footed ferrets; and
- If black-footed ferrets or sign are detected during surveys, all actions that may affect black-footed ferrets will be stopped immediately and section 7 review will be re-initiated with FWS.

Questar believes that year-round drilling would allow them to completely develop their leases in about half the time. That consequence of the Proposed Action

will be a long-term benefit to all wildlife since future traffic volumes on the PAPA will be substantially reduced. Vehicles have killed black-footed ferrets (records in Kinter and Martin, 1992). The Anticline Crest Road, used by Questar and other operators, is within 0.5 mile of white-tailed prairie dog colonies that have not been exempted by FWS from recommended surveys for black-footed ferrets (FWS, 2004b) and, until surveys have been conducted, remain as potential habitat for black-footed ferrets. There is no evidence to suggest ferrets are or have been present in those colonies.

Components of Questar's Proposed Action, namely construction of the condensate pipeline and installation of telemetry equipment on operating well pads will potentially benefit black-footed ferrets if they are now present on the PAPA or are present in the future. According to Questar's estimates, construction of the condensate pipeline and previously-approved produced water gathering system would eliminate more than 25,000 tanker truck trips annually when Questar's leases are at peak production. Such potential benefits, though, would only be realized after the water pipeline is constructed in 2004 and after the condensate pipeline is constructed in 2005 since tanker truck traffic required to service production facilities on Questar's lease will continue until completion of the condensate pipeline. Installation of telemetry equipment is also expected to reduce traffic by reducing the number of visits to well sites required during production. If black-footed ferrets are present in the vicinity of Questar's lease, there will be some risk of vehicle-related mortality associated with the Proposed Action since winter traffic that would otherwise be absent, will be necessary. Questar's proposal to transport workers to drilling sites by bus during winter will increase winter traffic. However, Questar's proposal to transport workers to drilling sites by bus during winter will generate less traffic than would occur without busing workers.

Although black-footed ferrets are extremely rare and have not been identified in the area crossed by the condensate pipeline, white-tailed prairie dog colonies are present and could provide potential ferret habitat. The pipeline crosses an area defined as the Moxa white-tailed prairie dog complex for 39.5 miles and an area defined as the Big Piney complex for 6.9 miles. Neither prairie dog complex has been exempted from recommended surveys for black-footed ferrets by FWS (2004b).

Prior to construction of the condensate pipeline, surveys for black-footed ferrets would be conducted in all areas of suitable habitat within 0.5 mile of the proposed pipeline. If black-footed ferrets are located during surveys, Questar and BLM will consult with the FWS to determine necessary conservation measures. These measures will insure that the Proposed Action will not likely to adversely affect black-footed ferrets.

Whooping Crane. Following their review of the PAPA EIS, FWS concurred with BLM's determination that project activities were not likely to jeopardize whooping cranes. That concurrence was based on minimal availability of migratory habitat and low numbers of birds migrating through the project area. Since the last member of the Rocky Mountain whooping crane population died in 2002, the Proposed Action, including year-round drilling and the proposed condensate pipeline, will have no effect on whooping cranes.

Gray Wolf. Though occupied ranges of wolves introduced to YNP has expanded to include the region north and east of the PAPA, their presence in the PAPA is not expected since they tend to avoid areas where human-related activities occur (Paradiso and Nowak, 1982) although wolves have preyed on domestic livestock as well as elk at winter feedgrounds in the region. Depredating wolves in the project area would likely be subject to control actions (FWS *et al*., 2004).

The Wyoming Brucellosis Task Force recommended thorough evaluations of future alternatives to elk feedgrounds with the objective to eradicate transmission of brucellosis. Whether feedgrounds in the region would be closed in the future is currently undetermined. Closure though, would likely disperse wintering elk and wolves might similarly disperse. Whether any wolf would pursue elk or other big game wintering on the PAPA is impossible to predict.

The proposed pipeline crosses two big game wintering areas where gray wolves could potentially be present. However, pipeline construction will be completed before those ranges are occupied by wintering big game. In the event, however remote, of a wolf being in the project area during construction, it would be expected to avoid the slow conspicuous movements of construction equipment. The Proposed Action, including year-round drilling and the proposed condensate pipeline, would have no effect on gray wolves.

Bald Eagle. Following their review of PAPA EIS, FWS concurred with BLM's determination that project activities were not likely to adversely affect bald eagles. That concurrence was based on mitigative measures provided in the PAPA EIS ROD including:

- No surface disturbing activities will occur within 1 mile of bald eagle winter use areas between November 15 and March 15;
- No surface disturbing activities (construction of roads, pipelines, well pads, drilling, completions,

workovers) will occur within 1 mile of an active bald eagle nest between February 15 and August 15;

- No permanent structure will be places within 2,600 feet from and out of direct line of sight to an active bald eagle nest;
- Wells placed closer than 2,600 feet (but not within 2,000 feet) of an active nest will be out of direct line of sight and will have no human activity from February 15 to August 15;
- Central production facilities will be at least 2,600 feet from an active bald eagle nest; and
- Prior to initiating surface disturbances during nesting and wintering periods, surveys for bald eagles will be conducted. New roads that may adversely affect bald eagles will require re-initiation of section 7 consultation with FWS.

The closest bald eagle nest to any of Questar's well pads that are proposed for year-round drilling is approximately 1.2 miles away. The Proposed Action (year-round drilling) will not affect nesting bald eagles. Likewise, the closest well pad proposed for year-round drilling to forest-dominated riparian habitat (New Fork River) that might be utilized by wintering bald eagles is greater than 1 mile. With that distance, wintering and/or migrating bald eagles that might utilize riparian habitat along the New Fork River will not be affected by the Proposed Action.

The southern terminus of the Anticline Crest Road (at the junction with the Paradise Road) is approximately 0.6 mile from forest-dominated riparian habitat and the Paradise Road passes through forest-dominated riparian habitat before intersecting U.S. Highway 191. Winter well-field traffic to and from the PAPA has been occurring through and adjacent to those riparian habitat areas potentially used by wintering and/or migrating bald eagles since 2000. Though there are no records of bald eagles killed on either road, bald eagles have been killed by vehicles in the general area during winter and at other times as they feed on roadside carrion (FWS, 1999a). With the elimination of tanker truck traffic to and from Questar's production facilities by construction of the condensate pipeline, the previously-approved produced water gathering system, and reduction of traffic during production by installing telemetry equipment at operating well sites, any risk of mortality to bald eagles by traffic on access roads within the PAPA will also be reduced. However, an unknown portion of that reduced risk will be offset since the Proposed Action will contribute to winter traffic that would otherwise be absent with no year-round drilling. Questar's proposal to transport workers to drilling sites by bus during winter will increase winter traffic but traffic will be less than expected if busing workers was not implemented.

Surveys for nesting bald eagles will be conducted in appropriate habitats prior to construction of the proposed condensate pipeline. If any active nests are found (those that have been occupied once in the past 3 years are defined as active by FWS) within 1 mile of the project, section 7 consultation with FWS will be re-initiated to insure that the project will not be likely to adversely affect bald eagles.

Grizzly Bear. Suitable habitat (relatively undisturbed mountainous habitat) is not present within the PAPA or near the proposed pipeline route and grizzly bears are not likely to occur in the area. The Proposed Action, including year-round drilling and the proposed condensate pipeline, will have no effect on grizzly bears.

Canada Lynx. Absence of montane, forested habitat in the PAPA and along the pipeline precludes Canada lynx from occurring within the vicinity of the Proposed Action. The Proposed Action, including year-round drilling and the proposed condensate pipeline, will have no effect on Canada lynx.

Colorado River Fish. FWS has determined that any withdrawal of water from the Colorado River System will jeopardize the following listed species: Colorado pikeminnow, humpback chub, bonytail, and razorback sucker. Water withdrawals from the Hams Fork, Green, and New Fork rivers for hydrostatic testing and dust control are likely to conform to the FWS definition of jeopardy to these species. As a reasonable and prudent measure, Questar will contribute a mitigation payment to the Colorado River Endangered Fish Recovery Program. Prior to initiating any project-related water depletion from the Colorado River System, re-initiation of formal consultation with FWS may be required.

Ute Ladies'-tresses. This species has not been detected within the PAPA and available information indicates it is not present. Field surveys were conducted for Ute-ladies' tresses within areas of suitable habitat along the entire condensate pipeline route in August, 2004 and no orchids were found. Further, there are no records of this species' presence in southwest Wyoming. The Proposed Action, including year-round drilling and the proposed condensate pipeline, will have no effect on Ute ladies'-tresses.

4.14.1.2 Candidate and Special Status Species.

Yellow-billed Cuckoo. This species does not occur within the PAPA or along the condensate pipeline route. The Proposed Action will have no effect on yellow-billed cuckoos.

Sage Grouse. Because FWS has yet to complete a 12-month finding for this species, effects of the Proposed Action are addressed in Section 4.15.2.1 - Upland Game Birds.

Pygmy Rabbit. Pygmy rabbits inhabit the PAPA and may be present along the condensate pipeline route. They are active during winter, feeding almost entirely on sagebrush (Green and Flinders, 1980) and apparently have small home ranges (Green and Flinders, 1979). Consequently, pygmy rabbits that might occupy sagebrush habitats proximate to well pads that have been subject to seasonal drilling stipulations would be exposed to the same disturbance sources if drilling continued year-round. There is no information to indicate how the species responds to year-round drilling but there is no reason to expect different behavioral response or diminished habitat function than already occurs with seasonal drilling stipulations applied.

Vehicles have killed pygmy rabbits on the PAPA. Questar's proposed mitigation to construct the condensate pipeline and install telemetry equipment at operating well sites will potentially benefit pygmy rabbits. Those potential benefits though, would only occur after the condensate pipeline is constructed in 2005 since tanker truck traffic required to service production facilities on Questar's lease area will continue until completion of the pipeline. Installation of telemetry equipment is expected to further traffic by reducing the number of visits to well sites required during production. Consequently, the Proposed Action is expected to reduce the risk of vehicular mortality to pygmy rabbits by reducing well field-related truck traffic on the Anticline Crest Road throughout the year. The Proposed Action however, will contribute some winter traffic volume to access well sites drilled during winter. Questar's proposal to transport workers to drilling sites by bus during winter will generate less traffic than would occur without busing workers.

Pygmy rabbits inhabiting big sagebrush within the pipeline right-of-way would be permanently displaced from those sites to habitat in surrounding areas but adverse effects to the population (increased mortality, decreased recruitment) are not expected.

Swift Fox. Disturbance of sagebrush-grasslands may reduce potential habitat for swift fox. Because of the swift fox's mobility and infrequent use of the area, the pipeline is not likely to affect the species. Due to the availability of habitat surrounding the proposed pipeline, minimal impacts are expected to occur to the local small mammal populations of the area, potential prey of swift fox. No swift fox have been found in the PAPA (McGee *et al*., 2002). The Proposed Action will have no effect on swift fox.

Mountain Plover. Following their review of PAPA EIS, FWS concurred with BLM's determination that project activities were not likely to jeopardize mountain plovers. That concurrence was based on mitigative measures provided in the PAPA EIS ROD including:

- Surveying suitable mountain plover habitat prior to initiating surface disturbance;
- If a nest(s) is found, delay disturbances 37 days or 1 week following hatching;
- If a brood is found, delay disturbances for 7 days; and
- Re-survey for active nests prior to construction. Apply appropriate buffers to prevent direct loss of any nest.

These measures would be applied even though mountain plovers are no longer proposed for listing under the ESA.

Construction of the condensate pipeline might positively affect mountain plovers through removal of taller shrub vegetation. Adverse impacts are not anticipated in areas where construction will begin after nesting season, July 15. By that time, young mountain plovers should have already fledged. In areas where construction is planned prior to July 15, surveys for nesting mountain plovers will be conducted and construction will only begin in areas approved by BLM.

Special Status Plant Species. The BLM has indicated the following special status plant species may occur within the vicinity of the proposed pipeline: Cedar Rim thistle, large-fruited bladderpod, Beaver Rim phlox, and tufted twinpod. Suitable habitat for BLM sensitive plant species will be identified prior to construction and surveys to locate sensitive plant populations will be conducted so that they can be avoided during construction or otherwise conserved.

4.14.2 Alternatives

No Action Alternative. Effects to listed species and special status species by development of Questar's lease area under the No Action Alternative would be the same as those analyzed in the PAPA EIS. Under this alternative, none of the potential benefits to listed and special status species that are expected from Questar's proposed mitigation would occur. Without construction and operation of the condensate pipeline, tanker truck traffic required to transport condensate from Questar's production sites will continue year-round. However, some year-round traffic will be reduced by Questar's installation of a previously-approved produced water gathering system. Potential effects to listed and special status species that were described for construction and operation of the condensate pipeline would not occur, although

probabilities of effect to those species are so low as to be discountable.

Without telemetry equipment installed to control and monitor producing wells on Questar's lease, operators will continue to visit production facilities year-round for the life of the project. Winter traffic to access year-round drilling operations however, will not occur.

Alternative A. Alternative A would have the same affects on listed and special status species as the Proposed Action. Tanker truck traffic would continue during winter 2004-2005 even though Questar will have installed their previously-approved produced water gathering system by then. Other mitigation proposed by Questar, including installation of telemetry equipment on operational well pads and transporting workers by bus to the single well pad allowed during winter 2004-2005, would be implemented under Alternative A. Winter drilling, whether by one pad with up to two rigs during winter 2004-2005 as allowed under Alternative A, or on three pads (with up to two rigs drilling simultaneously on each of the three well pads) beginning in 2005, is not expected to adversely affect listed or special status species. Year-round traffic volumes, expected under the No Action Alternative and anticipated in the PAPA EIS, are the principal source of impact to listed and special status species and will be much reduced under the Proposed Action and Alternative A.

Alternative B. All of Questar's proposed mitigation under the Proposed Action would be required under Alternative B but no year-round drilling would be allowed. As noted in the discussion of Alternative A, year-round traffic volumes on the PAPA are the principal source of impact to listed and special status species. Year-round drilling is not expected to adversely affect listed or special status species since those species either 1) are not present in the project area during winter, or 2) are present, but have been subject to well-field activities (associated with gas production) during winter since publication of the PAPA EIS ROD. Consequently, effects to those species under Alternative B are likely to be the same as discussed under the Proposed Action. With no winter drilling allowed under this alternative, there will be no winter traffic to access drill sites. Any potential effects to listed and special status species by winter traffic from bussing crews to and from drilling sites will not occur under Alternative B.

4.14.3 Cumulative Impacts

Questar's Proposed Action and the alternatives would not result in major changes to the cumulative impacts described for threatened and endangered species and special status species in the PAPA EIS. Questar's applicant committed mitigation measures, that are components of the Proposed Action (see Section 2.5), are expected to reduce cumulative impacts due to natural gas developments to levels below those analyzed in the PAPA EIS, at least within their lease area and affected portions of the PAPA.

There would be no anticipated cumulative effects to threatened and endangered species and special status species from construction of the proposed pipeline. The incremental disturbance associated with construction of the condensate pipeline will be a cumulative impact in the previously-disturbed utility alignment but would not significantly add to new disturbed areas in the vicinity or threaten the viability of any of the species that may inhabit the area.

4.14.4 PAPA ROD Consistency

The PAPA ROD contains specific mitigation guidelines and standard practices to protect threatened and endangered species and special status species. There are specific measures carried forward from the PAPA EIS to the ROD that provide protection to bald eagles, black-footed ferrets, and endangered Colorado River fish species. At the time the ROD was published, mountain plovers were proposed for listing as threatened and mitigation measures to protect the species were specified. But, that proposed status was withdrawn in 2003 (FWS, 2003a). In the ROD, BLM states that all actions to be implemented by the ROD would be in compliance with the ESA. Further, with any changes to the scope of the Pinedale Anticline Project analyzed in the PAPA EIS that could affect listed, candidate, or migratory bird species or their habitat differently than disclosed, BLM would re-initiate Section 7 consultation under ESA and any measures resulting from consultation would be implemented by the operators. Questar's Proposed Action is consistent with the PAPA ROD.

4.15 Wildlife and Aquatic Resources

4.15.1 Proposed Action

WGFD commented that seasonal stipulations have value as conservation measures but should "not be considered as exclusive approached to species conservation and management" (Appendix A). WGFD determined that the environmental benefits of the Proposed Action, with inclusion of Questar's applicant-committed mitigation measures, would exceed any benefits to fish and wildlife habitat function that might occur through consistent application of seasonal stipulations. According to WGFD, if all the applicant-committed mitigation proposed by Questar is implemented, the Proposed Action would decrease ongoing impacts to wildlife and aquatic resources in the PAPA. BLM concurs with WGFD's assessment of potential impacts from Questar's Proposed Action.

The PAPA EIS anticipated up to 4 well pads per square mile in MA 4 and 5. If the Proposed Action is implemented, the well pad density on Questar's lease area would be less than that. Overall, reduced surface disturbance translates as reduced direct impacts to habitats used by many of the wildlife species discussed in this section.

A second principal benefit to wildlife within the PAPA by the Proposed Action would be the elimination of nearly 25,000 annual trips from tanker trucks used to remove condensate and produced water. Reducing operations traffic by installing telemetry equipment at producing well sites will similarly benefit wildlife. These benefits to wildlife outweigh the potential short-term impact of additional winter traffic on Questar's lease area that would be associated with winter drilling, particularly since Questar has agreed to bus workers to drill sites.

An additional benefit of constructing the condensate pipeline and previously-approved produced water gathering system would include removal of condensate and produced water storage tanks at producing well sites. Removing the tanks eliminates manmade perch sites that can be used by raptors and ravens, potential predators of sage grouse and other wildlife.

Another important aspect of Questar's proposal is their plan to accelerate development of their lease area. Under the Proposed Action, Questar has estimated that development time would be decreased by approximately one-half. This will greatly benefit wildlife by concentrating disturbance-related activities within a much shorter time frame.

Questar's commitment to fund and/or develop projects that will enhance wildlife habitats (i.e., compensatory mitigation) is another primary benefit of the Proposed Action. Those projects would be beneficial to some or all of the wildlife species discussed in this section but specific effects to habitat function for species cannot be addressed until project scopes and locations are defined. Decisions about specific projects and their scope and locations will be made following the conclusion of this NEPA process.

4.15.1.1 Big Game

Year-Round Drilling

Pronghorn. Questar's lease area coincides with habitat used by pronghorns in the Sublette Herd Unit during spring, summer and fall (SSF range) although recent information indicates some portions of Questar's lease area are occupied by wintering pronghorn, particularly during early spring if winter snow has receded (Sawyer *et al*., 2002). However, the Anticline Crest Road passes through crucial winter range for approximately 3.6 miles to the junction with Paradise Road and that road crosses crucial winter range for approximately the same distance. Generally, pronghorns migrating to winter range on the PAPA from the north are likely to pass through portions of Questar's lease area and, depending on weather conditions, move through during October through December when current winter drilling stipulations are applied.

Pronghorns on crucial winter ranges within the PAPA and those that may occupy habitats within Questar's lease area during winter have been exposed to limited winter drilling of single wells exempted from seasonal stipulations by BLM in the winters of 2002-2003 and 2003-2004. They have also been exposed since 2001 to activities associated with producing wells during winter, namely tanker truck traffic hauling condensate and produced water as well as operator traffic traveling to producing wells. During the same period, WGFD has estimated the herd unit population increased although fawn production decreased. Fawn production, though, has been generally declining for the past two decades (see Chapter 3 and Wildlife Technical Report, Section 1). Those observations suggest that mortality in the herd unit is low, especially fawn overwinter mortality.

The Proposed Action could adversely affect wintering pronghorn by the same mechanisms that were described in the PAPA EIS; by increasing their energy expenditures during escape through snow from development activities in winter and/or displacement to alternate habitats that could be less capable of providing adequate overwinter function for pronghorns. If overwinter mortality of pronghorns has indeed been low as hypothesized, pronghorns migrating to and wintering on the PAPA have not been adversely affected by natural gas developments so far, at least to the extent that survival of animals in the Sublette Herd Unit has affected population growth.

Though there are no records of pronghorns killed on access roads to Questar's lease area, pronghorns have been killed by vehicles elsewhere on the PAPA (U.S. Highway 191 in the vicinity of the Trapper's Point migration bottleneck) but mostly during summer and early fall. Nevertheless, eliminating tanker truck traffic to and from Questar's production facilities by construction of the condensate pipeline and previously-approved produced water gathering system, as well as reducing traffic during production by installing telemetry equipment at operating well pads, will reduce the risk of pronghorn-vehicle collisions within the PAPA throughout the year. If wintering pronghorns escape from vehicles and well-pad activities associated with production during winter, the same components of the Proposed Action are

expected to reduce energy expenditures. Implementation of Questar's Proposed Action will result in limited additional winter traffic in the PAPA. However, Questar's proposal to transport workers to drilling sites by bus during winter will reduce this winter traffic.

Mule Deer. Questar's lease area is within crucial mule deer winter range used by the Sublette Herd Unit. Analyses of overwinter fawn mortality indicate that fawn deaths increase with increasing winter snowfall, estimated for each month on crucial winter ranges used by the population (Wildlife Technical Report, Section 2). Since winter 2001-2002, total snowfall from October through April has had significant effects on fawn mortality whereas before 2001, fawn mortality was significantly related to total snowfall from November through March. Prior to 2001, mule deer fawns were apparently less susceptible to effects by snowfall in October and April than they have been since 2001.

During the past 4 years, 2001-2004, development in the PAPA has progressed and at the same time, annual precipitation (during water years) on the crucial winter ranges has been significantly below average. Drought conditions affect winter forage quality and quantity (McKinney, 2003) and have likely contributed to the observed increase in susceptibility of fawns to longer periods of snow accumulation since 2001. Similar drought conditions have been experienced by mule deer in the Wyoming Range Herd Unit since 2001 but elevated fawn mortality rates there were not observed to be excessive until 2004, after more than 4 consecutive years of drought (Wildlife Technical Report, Section 2). These comparisons suggest that factors in addition to winter snowfall and drought may be influencing fawn mortality on the Sublette Herd Unit winter ranges. But, these data do not indicate that natural gas development on the PAPA has influenced fawn overwinter mortality; most likely cumulative effects due to climate and/or recent changes in land uses throughout the herd unit (which extends well beyond the PAPA) have contributed to the observed trends in fawn overwinter mortality. Data do not yet exist to determine if natural gas developments affect fawn overwinter mortality.

Mule deer wintering on crucial ranges within Questar's lease area have been exposed to limited winter drilling of single wells exempted from seasonal stipulations by BLM in the winters of 2002-2003 and 2003-2004. They have also been exposed to activities associated with producing wells during winter (tanker truck traffic hauling condensate and produced water and traffic by operators traveling to producing wells) since 2001. Phase II of the Sublette Mule Deer Study (Sawyer *et al*., 2003) has been in progress since 2000, continuing as development progressed following publication of the ROD. Preliminary results reveal that probable use of the Pinedale Mesa by wintering mule deer is lowest where well pads have been developed (Sawyer *et al.,* 2004).

In the winter following publication of the ROD (2000-2001) approximately 41 acres of the PAPA had been disturbed by 11.4 miles of new roads and 39 acres of well pads had been constructed; the optimal distance of wintering mule deer to the closest well pad was estimated to be 1.4 miles away. By the next year (2001-2002), 24.5 miles of roads had cumulatively disturbed 89 acres and well pad had disturbed 152 acres. In that winter, the optimal distance between mule deer and the closest well pad was predicted to be 2.2 miles. But in 2002-2003, mule deer were predicted to be 2.7 miles from the closest well pad, a distance with the greatest probability for high deer use during winter. By that winter, 42.6 miles of roads had been constructed since publication of the ROD with concomitant cumulative total disturbance of 155 acres and 353 acres disturbed by well pads (Sawyer *et al.,* 2004). This incremental annual increase in the distance between areas that mule deer are highly likely to use in winter and well pads has been predicted from data collected during winters with only 1 drilling rig present but with all the traffic and activity normally associated with producing well pads.

Available information on fawn production and overwinter survival do not indicate that there are significant differences between mule deer wintering on the Pinedale Mesa and those wintering on the Pinedale Front which, in the Phase II study, serves as a control area for comparison to observations made on the Mesa (Sawyer *et al*., 2004). Indeed, fawn production in the Sublette Herd Unit has been relatively consistent over the past two decades; there is no declining trend in fawn production similar to that observed for pronghorns in the Sublette Herd Unit (Wildlife Technical Report, Section 1).

Should the Sublette Mule Deer Study eventually demonstrate increased overwinter mortality and consistent utilization of habitats with less than adequate functional value to wintering deer as result of development, those effects were anticipated by impact analysis in the PAPA EIS. One component of Questar's proposal is to continue funding of the Phase II study and expand the study to include effects of year-round drilling on mule deer.

Available information (Sawyer *et al.,* 2004) indicates that the presence of well pads, which to date have been focal points of human activities during winter, is likely to have the greatest influence on wintering mule deer habitat use and distribution on the Pinedale Mesa. Even though winter stipulations have mostly been in effect, producing well pads that were cleared

and drilled before November 15 of any year must be attended throughout the winter by trucks hauling condensate and produced water as well as by operators' maintenance actions. Those winter activities have been ongoing throughout Questar's lease area.

Drilling two wells on a single pad will produce more localized disturbance (noise, night-lighting, engine exhausts, workers present all day, every day) than truck trips to haul produced water and condensate and operator attendance at a producing well pad during winter. Under the Proposed Action, up to three well pads would be drilled by two rigs each throughout the winter. After 2005, however, installation of the condensate pipeline and previously-approved produced water gathering system (installed in 2004) will reduce winter activities at producing well pads. Questar's proposal to install telemetry equipment at operating well pads will further diminish those sites as focal points of human activities during winter, beginning in 2005. Consequently, the Proposed Action will reduce the number of sites that are likely to have the greatest influence on wintering mule deer habitat use and distribution on the Pinedale Mesa. That benefit is not expected during winter 2004-2005 since hauling condensate as well as operator attendance will continue as in the past. Mule deer winter habitat use on the Pinedale Mesa during 2004-2005 is likely to be more influenced by the presence of well pads - particularly with drilling two wells from a single pad - than has been predicted in previous years.

There are no records of mule deer killed on access roads to Questar's lease area although they have been killed in higher numbers than pronghorn on all segments of U.S. Highway 191 that parallel the PAPA, especially during winter. Eliminating tanker truck traffic during all seasons and reducing lease area traffic by installing telemetry equipment at operating well pads will reduce risks of mule deer-vehicle collisions on all roads, including those within the PAPA. However, under the Proposed Action, those beneficial mitigation measures will not occur until 2005. Consequently, year-round drilling during 2004-2005 will not be mitigated by traffic reduction.

Implementation of Questar's Proposed Action will result in limited additional winter traffic in the PAPA. However, Questar's proposal to transport workers to drilling sites by bus during winter will minimize this additional winter traffic.

Elk. Elk in the Green River and Pinedale herd units are not likely to be affected by the Proposed Action since use of habitats within the PAPA is currently limited. Elk are occasionally killed by vehicles on U.S. Highway 191. Reducing traffic on the PAPA by constructing the condensate pipeline and installing telemetry equipment may benefit elk but those components of the Proposed Action are not expected to produce measurable effects.

There has been some discussion about closing elk feedgrounds in the region to reduce or eradicate transmission of brucellosis between elk and livestock. Though closure would likely disperse wintering elk there is no way to anticipate elk presence on the PAPA in the future.

Condensate Pipeline

Loss of habitat and disturbances to animal activity would occur from construction activity. Approximately 8 miles of the condensate pipeline route will be constructed through pronghorn crucial winter range. No crucial winter ranges or other sensitive areas utilized by mule deer or moose would be crossed by the proposed pipeline. However, 6 miles of the pipeline route will cross crucial severe winter relief range used by elk during extreme winter conditions. Since construction is planned to begin in May and be completed by November 15, 2005, wintering big game will not be affected by construction.

Impacts to local populations include loss of forage in the construction right-of-way and displacement in the vicinity of construction activities during the construction period. Since much of the construction would be adjacent to existing pipelines, disturbances would be minimal to pronghorn and mule deer in the area. Following construction, all disturbed surfaces would be reseeded so that forage would again be available after vegetation is restored. No fencing is proposed that could impact big game. No significant impact to big game by the proposed condensate pipeline is expected.

4.15.1.2 Upland Game Birds

Year-Round Drilling

Relative abundance of sage grouse has been declining in the region that includes the PAPA and the condensate pipeline route (Wildlife Technical Report, Section 1) as they have been throughout western North America (Braun, 1998). Counts of males attending leks on the PAPA and vicinity have declined from 1998 to 2004. Available data indicates that male counts on leks within 2 miles of a drilling rig declined by an average of 32 percent annually while counts on leks within 0.3 mile of a road declined at an average annual rate of 19 percent. Annual counts of males attending leks farther than 4 miles from well-field activities declined by an average of only 2 percent annually (Holloran and Anderson, 2004). Further, rates of decrease for numbers of males attending leks proximate to roads were positively correlated with

traffic volume (Holloran and Anderson, 2004); more traffic presumably led to lower lek attendance.

Sage grouse nesting habitat in dense sagebrush stands, in combination with presence of residual grass cover, contributes positively to nesting success (Heath *et al*., 1997 and Holloran *et al*., 2004). Presence of tall, dense grass cover in spring (residual cover from the previous years' growth) was found to increase the chance of nest success (Holloran *et al*., 2004). But sage grouse hens that mate on leks disturbed by natural gas development (within approximately 1.9 miles from well pads or roads) nested significantly farther away from the lek than hens mating on undisturbed leks. Additionally, hens from disturbed leks initiated nesting significantly less while selecting sites with greater sagebrush cover compared to hens bred on undisturbed leks (Lyon, 2000 and Lyon and Anderson, 2003).

Year-round drilling will occur while sage grouse attend leks and select nest sites on the PAPA. There are 4 leks on the PAPA that are within 1.9 miles of a well pad inside Questar's lease area and which would be drilled year-round under the Proposed Action. The farthest any of the 4 leks is from a road is 1.8 miles; the closest is approximately 300 feet. Recent research conducted on the PAPA strongly suggests that those leks have already been impacted by natural gas development and impact to nesting sage grouse has occurred as well. Year-round drilling may exacerbate those impacts, most likely through processes associated with the presence of drill rigs and noise that would otherwise be absent with application of seasonal stipulations. Some portion of that impact is expected to be diminished by Questar's proposed mitigation that will reduce traffic on access roads to producing well pads (by the condensate pipeline, previously-approved produced water gathering system and installation of telemetry equipment) during all times of the year, including periods of lek attendance and nest initiation. By bussing work crews to year-round drill sites during winter, between 8 am and 8 pm, Questar will minimize traffic effects that could be substantial if bussing does not occur. And, Questar has committed to coordinate with BLM and WGFD when siting well pads on which year-round drilling is proposed, to avoid further affecting sage grouse habitat functions.

An additional benefit of constructing the condensate pipeline and previously-approved produced water gathering system would include removal of condensate and produced water storage tanks at producing well sites. Removing the tanks eliminates manmade perch sites which can be used by raptors and ravens that prey on sage grouse and other wildlife.

Wintering sage grouse have been documented on Questar's lease during 2002 and 2003 while tanker trucks have been hauling condensate and operators have been accessing production pads in winter. There is no information about sage grouse response to roads during winter and certainly none on effects of drilling during winter. But, reducing traffic is likely to benefit wintering sage grouse even though effects of winter drilling have not been established.

Due to limited surface disturbances and the large amount of habitat available, adverse impacts to sage grouse are not anticipated from construction and operation of the condensate pipeline. The pipeline will be constructed parallel to and overlapping existing pipeline rights-of-way for most of its length and portions of the route have been previously disturbed. Approximately 755 acres of vegetation would be disturbed by construction. No surface disturbance will occur within 0.25 mile of a lek; other human activities within 0.25 mile of an occupied lek will be avoided between 8:00 pm and 8:00 am from March 1 through May 15; disturbance actions will be avoided between March 15 and July 15 in suitable nesting and early brood-rearing habitat within 2 miles of a lek or those habitats that have been identified beyond 2 miles of a lek. Field evaluations may be necessary to determine presence of leks and/or nests if existing information is not current or available.

4.15.1.3 Migratory Birds

Raptors. BLM would impose buffers around active raptor nest sites to prevent disturbance. No surface disturbing activities would be permitted within 0.5 mile of active raptor nests and within 1 mile of an active ferruginous hawk nest (active nests are defined as those occupied within the past 3 years) during the period from February 1 through July 31. Exclusion dates and buffer distances may be adjusted based on site-specific conditions. Consequently, no impacts to nesting raptors are anticipated.

Burrowing owls or owl nests were not observed during field surveys of the condensate pipeline. Areas of suitable habitat (prairie dog colonies) inside the proposed pipeline area of disturbance were investigated during August 2004. Surveys for burrowing owls will be conducted prior to construction. If any owls are observed, the appropriate spatial and temporal buffers would be observed until chicks have fledged.

Other Neotropical Migratory Birds. Loss of sagebrush-steppe and increasing levels of fragmentation in remaining sagebrush-dominated habitats have become concerns since there have been concomitant declines of sagebrush-dependent migratory passerine bird species (Knick and Rotenberry, 1995; Knick *et al*.,

2003). A study on the effects of well field roads on densities of Brewer's sparrow and sage sparrow as well as other species dependent on sagebrush for nesting habitat found that those species' densities were markedly reduced within 300 feet of a road compared to densities beyond that distance (Ingelfinger, 2001). Disturbance by vehicular traffic accounted for some of the reduced density effects while the presence of an edge (change in vegetative type) in otherwise continuous stands of sagebrush may have had an influence; a similar reduction in sage sparrow density was also observed along a pipeline alignment (Inglefinger, 2001). Horned larks were found potentially displacing other species along roads through aggressive behavior (Inglefinger, 2001).

In the region including Questar's lease area and the proposed condensate pipeline, horned lark abundance appears to be relatively constant but recent trends in sage thrasher abundance indicate they may be decreasing in the region (Wildlife Technical Report, Section 1). Other sagebrush-dependent species that were affected by roads on and near the PAPA have recent trends that indicate their abundance is relatively constant in the region (Brewer's sparrow, vesper sparrow) or slightly increasing (sage sparrow).

Because most of the proposed condensate pipeline will be within or adjacent to existing pipeline rights-of-way, construction is not expected to create significant new edge features through otherwise continuous sagebrush habitat. Neotropical migrants that are also sagebrush obligates are not expected be adversely affected by the project or face significant cumulative effects in the pipeline area of disturbance.

Questar's construction of the previously-approved produced water gathering system, their proposal to construct the condensate pipeline and to install telemetry equipment on operating well sites would potentially benefit breeding birds on the PAPA. Those potential benefits though, would only occur after the condensate pipeline is constructed and operational in 2005 since tanker truck traffic will continue until completion of the pipeline. Installation of telemetry equipment is expected to further reduce traffic by reducing the number of visits to wells required during production. Consequently, the Proposed Action is expected to reduce effects on neotropical migrants by vehicular traffic on the Anticline Crest Road during the breeding season as well as throughout the year.

4.15.1.4 Wild Horses

The BLM considers any activity that results in substantial habitat loss or a permanent reduction in the wild horse population below established management levels to be a significant impact. Revegetation with palatable forage would occur along the right-of-way after pipeline construction is complete. Grasses would be established in approximately 3 years. Horses would be able to leave the relatively small, affected area during pipeline construction. Due to the availability of habitat in the area surrounding the pipeline route, the 755-acre disturbance and short-term loss of forage caused by construction would not have a significant impact on wild horses in the project area.

4.15.1.5 Aquatic Resources

Construction of the condensate pipeline is not expected to measurably affect fish populations in the Blacks Fork, Hams Fork, Green and New Fork rivers. The pipeline will be placed beneath the rivers by HDD. Successful use of HDD is considered an effective technique for avoidance of instream impacts by eliminating the need for instream excavation (Reid *et al*., 2004). Even with this technique there is a potential for impact with the HDD process. Drilling requires use of a drilling mud for lubrication of the bit and removal of cuttings. Bentonite clay will be used as the drilling mud. Because the drilling mud is under pressure during drilling, if the bit encounters substrate fractures or channels it is possible for bentonite to escape from the hole (termed a "frac-out"). Bentonite can escape to the surface if the fractures lead to and through the drilled substrate.

Bentonite, by itself, is essentially non-toxic (Breteler *et al.,* 1985; Hartman and Martin, 1984; and Sprague and Logan, 1979). Bentonite, as with any fine particulate material, can interfere with oxygen exchange by gills (EPA, 1986), and the degree of interference generally increases with water temperature (Horkel and Pearson, 1976). This is a localized effect, and if any impacts do occur, those impacts would be limited to individual fish in the vicinity of the leak. Fish move away from turbidity spots and plumes and if a frac-out occurred, there would be minimal impact to fisheries and aquatic resource in the immediate area.

Additional mitigation measures discussed in Section 4.10.5 also apply to aquatic resources.

4.15.2 Alternatives

No Action Alternative. Effects to wildlife and aquatic resources by development of Questar's lease under the No Action Alternative would be the same as those analyzed in the PAPA EIS. Under this alternative, none of the potential benefits to wildlife and aquatic resources that are expected from Questar's proposed mitigation would occur. However, an undetermined volume of year-round traffic will be eliminated by construction and operation of the previously-approved produced water gathering system. Nevertheless, without construction and operation of the condensate

pipeline, tanker truck traffic required to transport condensate from Questar's production sites will continue. Potential effects to wildlife and aquatic resources that were described for construction and operation of the condensate pipeline would not occur, although those affects are expected to be negligible.

Without telemetry equipment installed to control and monitor producing wells on Questar's lease area, operators will continue to visit production facilities year-round for the life of the project. Winter traffic to access year-round drilling operations however, would not occur.

The amount of time required to fully develop Questar's lease will not be decreased by half; and is expected to remain unchanged from the duration of development anticipated in the PAPA EIS. Noise, visual disturbance, and effects to air quality occurring during flared well completions would continue. Habitat enhancements proposed by Questar would not be implemented; however, without locations and descriptions of habitat enhancement projects, potential benefits to wildlife cannot be evaluated. Finally, the opportunity to gain valuable knowledge about effects on mule deer by natural gas developments, and winter drilling in particular, would be lost without continued support for Phase II and expansion of the Sublette Mule Deer Study, both of which are parts of the Proposed Action.

Alternative A. Alternative A would have the same effects on wildlife and aquatic resources as the Proposed Action. Tanker truck traffic would continue during winter 2004-2005 as it would until completion of the condensate pipeline in 2005. Drilling two wells from a single well pad during winter 2004-2005, allowed under Alternative A, is expected to generate more impact to mule deer (and possibly wintering pronghorns) than the No Action Alternative and Alternative B but less impact that than the Proposed Action, but only during that winter. Other mitigation proposed by Questar, including installation of telemetry equipment at operational well sites and transporting workers by bus to the single well pad allowed for drilling by up to two rigs during winter 2004-2005, would be implemented under Alternative A. Information currently available indicates that the presence of well pads, roads and traffic that would be expected under the No Action Alternative and anticipated in the PAPA EIS, are the principal source of impacts to big game, sage grouse and neotropical migratory birds. Those effects will be much reduced under the Proposed Action and Alternative A.

Alternative B. No impacts from winter drilling would occur. All of Questar's proposed mitigation would still occur except habitat enhancement mitigation. Tanker truck traffic and operator visits to well sites would be reduced. However, Questar believes that the time required to fully develop their lease area would be approximately doubled.

4.15.3 Cumulative Impacts

Questar's Proposed Action and the alternatives would not result in major changes to the cumulative impacts described for wildlife and aquatic resources in the PAPA EIS where the argument was advanced (with supporting documentation cited) that sources of impact to wildlife that are localized and predictable in time and space would generate fewer adverse effects than sources that are unpredictable in time and space. Consequently, zones of effect surrounding localized, focal points of disturbance are expected to be relatively constant, producing less impact than zones of effect associated with spatially dispersed and temporally unpredictable sources. Similar concepts have been recently advanced by WGFD (2004b) regarding spatial effects to wildlife habitat function beyond direct loss of habitat.

As described throughout this section, the Proposed Action will generate a localized, albeit predictable in time and space, source of impact by drilling up to 2 rigs each on 3 well pads during winter. Questar's proposed mitigation components, specifically construction of the condensate pipeline and installation of telemetry equipment at producing well sites, are expected to significantly reduce traffic volumes during winter as well as the rest of the year. Similarly, traffic volumes will decrease once the previously-approved produced water gathering system is fully functional.

While traffic is spatially localized to some degree, the presence of a vehicle at a specific location and time cannot be predicted by wildlife. Roads with traffic in combination with multiple, widely dispersed focal points of disturbance (producing well pads) are likely to generate more expansive zones of effect to wildlife than drilling at the same location year-round. By reducing traffic on the PAPA, cumulative impacts due to natural gas developments are likewise expected to be reduced. Further, localizing winter drilling at three well pads while reducing or eliminating human presence at numerous producing well pads during winter will minimize the number of disturbance focal points that are likely to have the greatest affect on wildlife wintering on the Mesa. Those beneficial effects will only occur within the portion of Questar's lease that is managed by BLM. Winter drilling may or may not occur on Section 16 (T. 32N, R. 109W), owned by the State of Wyoming, with or without implementation of the Proposed Action or any of the Alternatives. Consequently, effects of winter drilling under the Proposed Action or Alternative A will be cumulative to the effects of any winter drilling on Section 16.

Construction of the pipeline would increase the amount of surface disturbance along the pipeline route by 755 acres. The pipeline route, however, was selected so that the pipeline could be constructed in a way that minimizes impacts to natural resources. The condensate pipeline will result in localize disturbance with minimal cumulative loss of vegetation and wildlife habitat.

4.15.4 PAPA ROD Consistency

The PAPA ROD contains specific mitigation guidelines and standard practices to protect wildlife and aquatic resources. There were specific measures carried forward from the PAPA EIS to the ROD that provided protection to sage grouse and wintering big game through adherence to the mitigation guidelines and standard practices stipulated in Appendix A of the ROD. Section A-6 of Appendix A does allow for exceptions to wildlife seasonal stipulations following BLM consultation with WGFD. This EA is intended to evaluate the impacts of year-long drilling in Questar's lease area and supplement information contained in the PAPA EIS and ROD.

4.16 Air Quality

4.16.1 Proposed Action

Impacts to air quality from exploration and development in the PAPA are described in Section 4.10 of the PAPA EIS. Questar's Proposed Action is not expected to increase emissions associated with completing development of their lease acreage.

Under Questar's Proposed Action, six drilling rigs would operate in the PAPA in the winter months. Currently, winter drilling is not allowed without an exception. The exception review process is outlined in the PAPA ROD. According to Questar, wells drilled in the winter would replace wells that would otherwise be drilled in the summer months. Therefore, there would be no net yearly increase in emissions from drilling rigs in Questar's lease area. However, there will be benefits to air quality as a result of the Proposed Action because of applicant-committed mitigation measures proposed by Questar. These include installation of a condensate pipeline, implementation of flareless completions and implementation of EPA Tier II compliant drilling rig engines or alternate fuels by 2007 which will all reduce overall emissions from Questar's lease acreage in the PAPA. WDEQ supports this determination (see Appendix G). In a letter to BLM, WDEQ stated the following: "*WDEQ … believes that the environmental benefits to be gained through the implementation of the Questar proposals are significant, and will lead to overall air quality improvement.*"

Although there is evidence that the current level of annual nitrogen oxides (NO_x) emissions in the PAPA exceeds those used in the air quality model assumptions for the PAPA EIS, the Proposed Action, when fully implemented, will not result in an increase in NO_x emissions in the PAPA from current levels. WDEQ agrees with this conclusion. In their letter to BLM (Appendix G) WDEQ states "*The Wyoming Department of Environmental Quality (WDEQ) has taken a preliminary look at the nitrogen oxide emissions that would be generated from the six drill rigs that Questar would utilize under their Winter Drilling proposal. Based on this evaluation, the WDEQ believes the Questar Winter Drilling Proposal would not create any additional impacts from the current level of nitrogen oxide emissions in the Pinedale Anticline area.*"

To further reduce existing emissions in the PAPA, Questar has committed to the use of either EPA Tier II compliant drill rig engines or alternate fuel drill rig engines by 2007. Assuming that a single well takes 90 days to drill, NO_x emissions from a 3,000 horsepower drill rig would be reduced from 42 tons to 9 tons. Using actual drilling information from 2003, Table 4-1 shows how nitrogen oxide emissions would be reduced within the PAPA on an annual basis by implementation of the EPA Tier II technology on drill rigs.

Table 4-1
Estimated Nitrogen Oxide Emission Reduction in the PAPA Using EPA Tier II Compliant Engines [1]

Average Drill Rig Engine Horsepower	No Emission Controls NO_x Emissions (tons/year)[2]	Tier II Emission Controls NO_x Emissions (tons/year)[3]	Net Reduction in NO_x Emissions (tons/year)
1,000	623	134	489
2,000	1,246	268	978
3,000	1,869	402	1,467

[1] Calculations are based on 2003 actual drilling data from WOGCC. Assumes 4,010 days of drilling per year with a load factor of 0.42.
[2] No Emission Controls case uses an emission rating of 14 g/hp-hr.
[3] Tier II Emission Controls case assumes an emission rating of 3 g/hp-hr.

As a part of the Proposed Action, Questar will install a condensate pipeline. BLM has previously approved installation of a produced water gathering system. These pipeline systems will eliminate the need to store condensate and produced water on well sites. Questar has estimated that at peak production in 2008, a total of 25,000 annual tanker truck trips would be eliminated by these pipeline systems. The benefits to air quality as a result of the installation of the pipelines are two-fold. First, there will be no need for the on-site tanks that store the condensate. Volatile

organic compounds (VOCs) and hazardous air pollutants (HAPs) are emitted from the condensate storage tanks through the vent lines and are also released into the atmosphere when the truck hooks up to the tank to empty it. Therefore, there will be a net reduction of VOC and HAP emissions in the PAPA as a result of the Proposed Action. Questar has committed to fund and conduct a HAP Assessment within their lease area under the guidance of WDEQ. Secondly, NO_x, other combustion-related emissions and fugitive dust will be reduced by eliminating the tanker truck traffic (25,000 annual trips) in the PAPA.

Questar has also committed to using flareless completions (where feasible) as a part of the Proposed Action. Typically during well completion, a significant amount of natural gas is flared. The flared gas results in short-term emissions of combustion products of natural gas. The use of flareless completions will eliminate the need to flare natural gas thereby further reducing combustion emissions within the PAPA.

Installation of the condensate pipeline would cause temporary and short-term emissions and dust during pipeline construction due to truck traffic to and from the work location and equipment used during construction. Once the pipeline is installed, there would be no impacts to air quality as a result of pipeline operation.

4.16.2 Alternatives

No Action Alternative. Under this alternative, the benefits to air quality that result from Questar's applicant-committed mitigation would not occur. Air quality impacts described in the PAPA EIS from drilling and completion would continue. There would be no short-term impact to air quality as a result of installation of the condensate pipeline.

Alternative A. Under this alternative, benefits to air quality in the PAPA would be similar to those described for the Proposed Action because Questar would implement EPA Tier II technology or use alternate fuels engines within two years under either alternative.

Alternative B. Under this alternative, Questar would be required to implement mitigation for air quality impacts such as installation of the condensate pipeline and flareless completions, however, winter drilling would not be allowed. Questar's commitment to utilize Tier II or alternative fuel engines is voluntary and would not occur under this alternative. Impacts to air quality would be greater than under Alternative A or the Proposed Action.

4.16.3 Cumulative Impacts and PAPA ROD Consistency

The PAPA ROD states the following:

"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, 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)(l)(ii)."

Implementation of Questar's Proposed Action or Alternative A will not increase air quality emissions from the PAPA above the current levels. The current level of activity within the PAPA has exceeded the level of activity identified in the PAPA EIS. The PAPA EIS air quality analysis assumed that there would be 8 drilling rigs operating in the PAPA at any one time and in the early fall of 2004, there were 32 rigs operating in the PAPA. As discussed in Section 3.16, it is likely that NO_x emissions in the PAPA are more than twice that which was analyzed in the PAPA EIS.

BLM is currently addressing cumulative air quality issues the upper Green River Basin through a cumulative air quality analysis for the Jonah Field. This analysis will be available to the public in December, 2004. Based on the results of the Jonah Air Quality Analysis, BLM will determine the need for further evaluation of PAPA air quality impacts. This type of assessment is consistent with WDEQ's recommendation (Appendix G) to complete atmospheric dispersion modeling by 2006 and is consistent with the requirements of the PAPA ROD.

4.16.4 Additional Mitigation Opportunities

As described above, Questar's proposal will not increase emissions above current levels within the PAPA. However, additional mitigation measures have been recommended to further reduce impacts to air quality within the PAPA.

Questar should evaluate the feasibility of installing vapor recovery systems on the storage and processing equipment located at Gobblers Knob to further reduce air quality impacts. Questar and other PAPA operators should consider funding a contract mobile emissions WDEQ inspector for 5 years to assist in determining further methods that could reduce overall

emissions for the project. Finally, Questar and other PAPA operators should consider funding an air quality monitoring program for 5 years to determine ambient conditions and address public concerns relating to visibility and air quality. Monitored constituents should be determined by WDEQ and BLM.

Other operators should be encouraged to implement EPA Tier II compliant drill rig engines or alternate fuel engines to further reduce emissions in the PAPA.

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