



88065516



**U.S. Department of the Interior**

Bureau of Land Management

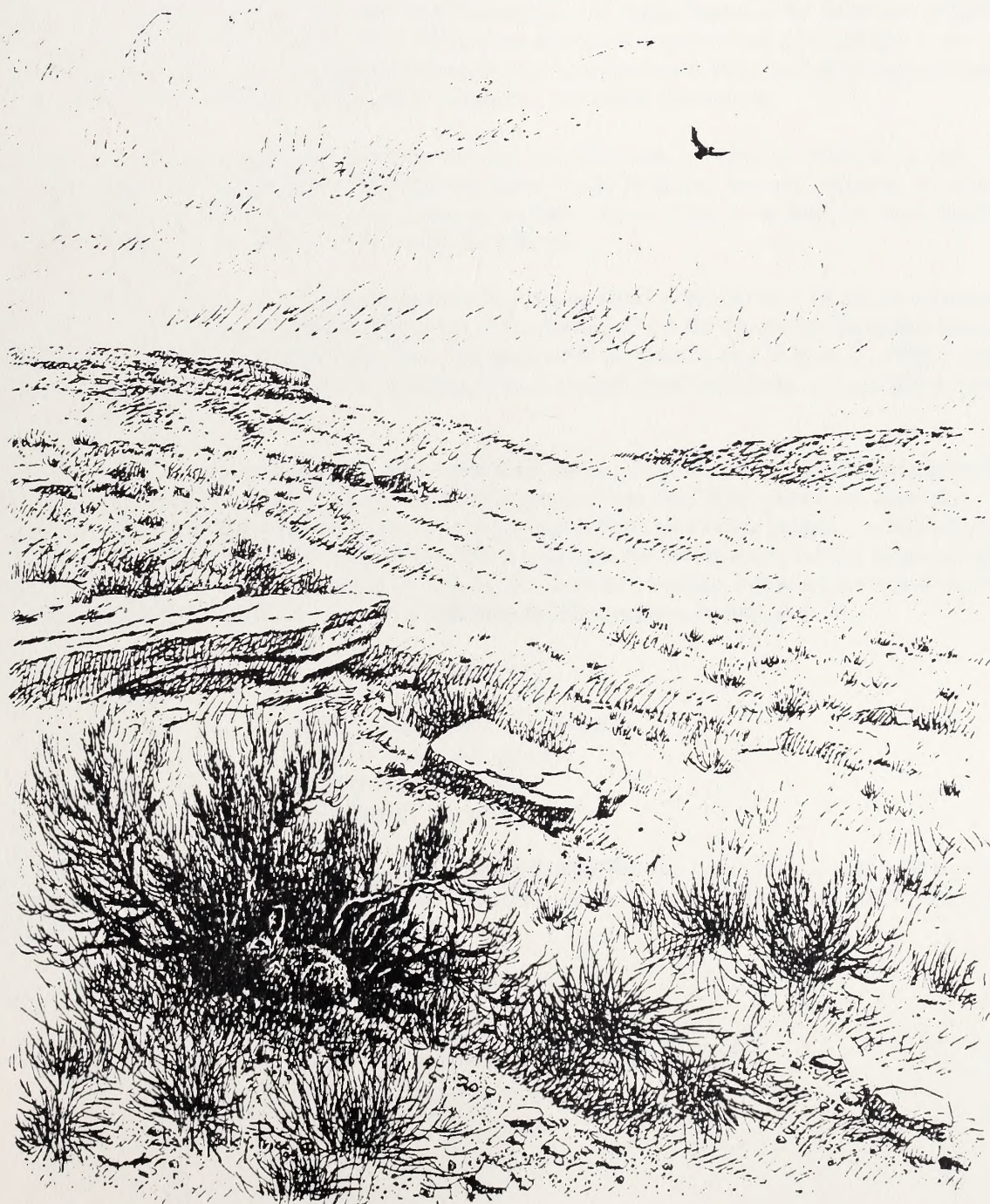
Wyoming State Office

Rock Springs District Office/Kemmerer Resource Area

June 1996



**FINAL**  
**Environmental Impact Statement**  
**Expanded Moxa Arch Area**  
**Natural Gas Development Project**  
**Sweetwater, Lincoln, and Uinta Counties, Wyoming**



The Bureau of Land Management is responsible for the balanced management of the public lands and resources and their various values so that they are considered in a combination that will best serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield; a combination of uses that take into account the long term needs of future generations for renewable and nonrenewable resources. These resources include recreation, range, timber, minerals, watershed, fish and wildlife, wilderness and natural, scenic, scientific and cultural values.

**BLM/WY/PL-96/020+1310**

**FES - 96 - 32**



# 36778907

88065516

HD  
243  
WR  
M6933



# United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
Wyoming State Office  
P.O. Box 1828  
Cheyenne, Wyoming 82003-1828

In Reply Refer To: 1996  
1793  
Moxa Arch  
(930DErsey)  
PHONE NO: 307-775-6290  
FAX NO: 307-775-6082

Dear Reviewer:

This final Environmental Impact Statement (EIS) on the proposed *Expanded Moxa Arch Area Natural Gas Development Project* is furnished for your review and comment. As a supplement to the draft EIS, published on April 14, 1995, this volume contains a revised *Executive Summary*; corrected and new material in an *Addendum and Errata* section; an expanded *Consultation and Coordination* section, including comment letters received on the draft EIS and BLM's responses to comments; and added *Appendices*.

Because this is an abbreviated final, this document and the draft EIS (with Air Quality, Wildlife Surveys, Soils and Water Resources, and Vegetation/Wetlands/Special Status Plants Technical Reports) comprise the entire document for filing purposes and for the decisionmaking process. Please refer to the draft for more detailed analysis and descriptions of the proposed action and alternatives.

Written comments will be considered in the decision if they are received within 30 days of the Environmental Protection Agency (EPA) Federal Register publication of the Notice of Availability of the Expanded Moxa Arch Area Natural Gas Development Project Final EIS. The anticipated publication date is June 21, 1996. Copies of the final EIS and the Technical Reports may be obtained upon request from the Bureau of Land Management, Rock Springs District Office.

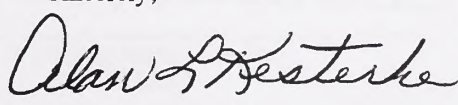
This final EIS is not the decision document. The decision on the proposed natural gas infill development and associated rights-of-way will be based upon the analysis in the draft and final EISs, public concerns and comments, and other multiple-use resource objectives or programs that apply to the project. A Record of Decision (ROD), detailing the decision of the BLM, and its rationale for the decision, will be prepared and distributed through the Wyoming State Office as soon as the decision is reached following the end of the 30-day review period. Presently, the ROD is anticipated to be available for release in August 1996.

Comments on the content of this final EIS should be sent to:

Bill McMahan, Project Coordinator  
Bureau of Land Management  
280 Highway 191 North  
Rock Springs, Wyoming 82901

The BLM appreciates the individuals, organizations, and Federal, State and local Governments who participated in the environmental analysis process. Your involvement has enhanced the integrity of the EIS and the public land managers ability to make an informed decision.

Sincerely,

  
for Alan R. Pierson  
State Director





**DEPARTMENT OF THE INTERIOR**

**FINAL  
ENVIRONMENTAL IMPACT STATEMENT**

**on the**

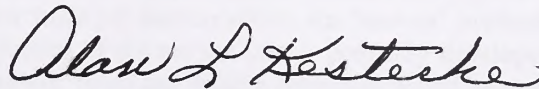
**EXPANDED MOXA ARCH AREA  
NATURAL GAS DEVELOPMENT PROJECT**

**Sweetwater, Lincoln, and Uinta Counties, Wyoming**

**June 1996**

**Prepared By:**

This Environmental Impact Statement was prepared by *Holsan Environmental Planning, Ecotone Environmental Consulting, Inc., and Hayden-Wing Associates* environmental consulting firms, with the guidance, participation, and independent evaluation of the Bureau of Land Management (BLM). The BLM, in accordance with Federal Regulation 40 CFR 1506.5(a) & (b), is in agreement with the findings of the analysis and approves and takes responsibility for the scope and content of this document.



---

Wyoming State Director  
**ASSOCIATE**





# EXPANDED MOXA ARCH AREA NATURAL GAS DEVELOPMENT PROJECT

Sweetwater, Lincoln, and Uinta Counties, Wyoming

## ENVIRONMENTAL IMPACT STATEMENT

Draft

Final

### Lead Agency:

U.S. Department of the Interior, Bureau of Land Management

### Cooperating Agencies:

U.S. Department of the Interior, Bureau of Reclamation  
U.S. Department of the Interior, Fish and Wildlife Service  
U.S. Department of Agriculture, Forest Service

### Counties That Could Be Directly Affected:

Sweetwater, Lincoln, and Uinta Counties, Wyoming

### Abstract:

The Expanded Moxa Arch Area Natural Gas Development Project EIS analyzes a proposal by the Moxa Arch operators (Amoco Production Company, Union Pacific Resources Company, Wexpro/Celsius Energy Company, Bannon Energy, Marathon Oil Company, Presidio Exploration, and other companies) to continue to infill drill additional development wells in their leased acreage within the Moxa Arch oil and gas development area. The project area encompasses approximately 476,261 acres of southwestern Wyoming. Lands associated with the additional drilling program include those previously analyzed in the Amoco Production Company Moxa Arch Natural Gas Production Environmental Assessment (EA) and Decision Record (DR) (USDI-BLM 1991) and the Supplemental EA and DR to the Amoco Production Company Moxa Arch Natural Gas Production Project (USDI-BLM 1992). Additional areas involved in the EIS, not included in the previous EAs, include lands to the north and south of the area previously analyzed. The additional area combined with the lands analyzed in the previous two environmental analysis documents form the Expanded Moxa Arch Natural Gas Development (Moxa) analysis area.

The Moxa analysis area includes portions of western Sweetwater, southwestern Lincoln, and northeastern Uinta Counties, Wyoming. The project area is generally located within Townships 15 through 23 North, Ranges 111 through 113 West, 6th Principal Meridian. The area is accessed by Interstate 80 and U.S. Highway 30. Access to the interior of the Moxa analysis area is provided by an extensive road network developed to service prior and on-going drilling and production activities.

Collectively, the Moxa Operators' proposal would continue to infill drill in the Moxa natural gas field, where 957 wells are presently active and up to 1,325 additional wells could be drilled over the next 10 years. Drilling estimates were based on the Moxa operators reasonable expectations that the "tight-gas" formation in this area could be developed at a average level of four wells per section within the "proven" production area and up to 2 wells per section within the "flank" area. A portion of the project area is presently developed on a 160-acre spacing (four wells per 640 acres). The Moxa Operators' plans and drilling schedules would be contingent upon both an increased demand for natural gas supplies in response to the Clean Air Act amendments of 1990 and an adequate price for the gas at the wellhead. The Draft and Final EIS impact analysis focuses on the resource issues and concerns identified during public scoping and in response to comments received on the Draft EIS. Potential impacts of concern from development were to livestock forage; recreation associated with Fontenelle Reservoir; crucial big game winter range and antelope migrations; sage grouse and raptor breeding and nesting; special status plant and wildlife species; soil erosion and sediment increases to the Hams Fork, Blacks Fork, and Green Rivers; groundwater

contamination; Oregon, Mormon Pioneer, Pony Express, and California Historic Trails condition and viewshed; impacts to air quality including air quality related values of the Bridger-Teton National Forest Bridger and Fitzpatrick Wilderness Areas; and cumulative effects.

**Other Environmental Review or Consultation Requirements:**

This Draft EIS, in compliance with Section 7(c) of the Endangered Species Act (as amended), includes the Biological Assessment for the purpose of identifying any endangered or threatened species which are likely to be affected by the proposed action.

**Lead Agency Contact:**

Bill McMahan, Project Coordinator  
Bureau of Land Management  
280 Highway 191 North  
Rock Springs, Wyoming 82901

**Date EIS Made Available to EPA and Public:**

|  |                       |
|--|-----------------------|
| <b>Draft:</b>                                  | <b>April 21, 1995</b> |
| <b>Final:</b>                                  | <b>June 21, 1996</b>  |
| <b>Final EIS Comments Must Be Received By:</b> | <b>July 22, 1996</b>  |



# TABLE OF CONTENTS

|  | <u>Page</u> |
|--|-------------|
| Cover Sheet .....  | i           |
| Preface.....   | iv          |
| Abbreviations.....   | v           |
| <b>SECTION 1: Executive Summary .....</b>  | <b>1-1</b>  |
| 1.1 Proposed Action and Alternatives .....   | 1-2         |
| 1.2 Major Impact Conclusions .....   | 1-3         |
| 1.3 Scope of Analysis .....  | 1-11        |
| 1.4 Summary of Cumulative Effects .....  | 1-12        |
| 1.5 Agency-Preferred Alternative .....   | 1-12        |
| <b>SECTION 2: Addendum and Errata .....</b>  | <b>2-1</b>  |
| 2.1 Introduction .....   | 2-1         |
| 2.1 Addendum .....   | 2-1         |
| 2.3 Errata .....   | 2-13        |
| <b>SECTION 3: Consultation and Coordination .....</b>  | <b>3-1</b>  |
| 3.1 Scoping Process .....  | 3-1         |
| 3.2 Draft EIS Consultation and Coordination .....  | 3-1         |
| 3.3 Public Review of Draft EIS .....   | 3-1         |
| 3.4 Draft EIS Comments .....   | 3-1         |
| 3.5 Common Concerns .....  | 3-1         |
| <b>SECTION 4: Comment Letters Received on the Draft EIS .....</b>  | <b>4-1</b>  |
| <b>SECTION 5: Response to Comments .....</b>   | <b>5-1</b>  |
| <b>APPENDICES</b>  |             |
| Appendix A: Summary/Table of Contents for the Air Quality Cumulative Impact Analysis Technical Report Addendum |             |
| Appendix B: Road Development Plan  |             |





## PREFACE

The purpose of this Final environmental impact statement (EIS) for the Expanded Moxa Arch Area Natural Gas Development Project is to supplement the Draft EIS which was published in April 1995. Reviewed together, the Draft and Final EISs incorporate the description of the proposed project, other alternatives including the "No Action" alternative and the affected environment, as well as the analyses of potential environmental consequences resulting from construction, operation, and abandonment of the proposed project. This Final EIS should not be considered as a complete EIS, nor as a decision document. This FEIS is organized into four sections:

- Section 1, *Executive Summary and Summary of Impacts by Alternative* - Information presented in this section that is different from material presented in the draft EIS is identified by shaded background.
- Section 2, *Addendum and Errata* - Provides an addendum of additional discussion and studies which have been completed to address comments received during the comment period on the draft EIS. Addendum material includes discussion on cumulative air quality impacts. It also includes an errata section showing changes in the text of the Draft EIS which resulted from public comment. Also included in the Errata section are three exhibits (Exhibits 2-13, 3-2, and 3-21) that were modified from the DEIS based on public comment. Two new exhibits are also included, Exhibits 2-1, and 2-2.
- Section 3, *Consultation and Coordination* - Summarizes the consultation and coordination that occurred during the preparation of the Moxa EIS and background information regarding the consultation and coordination process.
- *Appendices* - Two appendices not included with the draft EIS are provided in this final EIS. Appendix A contains the Executive Summary and Table of Contents for the Air Quality Cumulative Impact Analysis Technical Report Addendum; Appendix B provides a road development plan which contains standards and guidelines for transportation planning.

In response to comments received concerning cumulative impacts to air quality from the reasonably foreseeable implementation of the Moxa Arch, Fontenelle, Stagecoach Draw, Jonah, Wamsutter II, and other projects, the BLM, through the expertise of the firm *TRC Environmental Consulting, Inc.*, has supplemented the air quality sections of the draft EIS with an air quality cumulative impact analysis addressing the construction and operation phases of oil and gas development. The Section 2 Addendum of this final EIS expands upon the analysis found in the draft EIS. The details of this analysis are available in a separate Technical Report entitled *Cumulative Impact Analysis of Southwestern Wyoming Natural Gas Development Projects on Air Quality*. A copy of the technical report can be obtained from the Bureau of Land Management, 280 Highway 191 North, Rock Springs, WY 82901. It is also available for review at BLM offices in Rock Springs, Pinedale, Kemmerer, and Cheyenne, Wyoming; and the Forest Service Offices in Pinedale, Big Piney, and Jackson, Wyoming. A preliminary technical review of the Technical Report was conducted by the U.S. Environmental Protection Agency, Wyoming Department of Environmental Quality-Air Quality Division, and U.S. Forest Service Bridger-Teton and Shoshone National Forests. Although still subject to further comment by these agencies, concurrence in the scope, content, and analysis procedure contained in the Technical Report was given.

The draft and final EISs have been prepared according to the requirements of the National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Quality's regulations for implementing NEPA, effective July 30, 1979.

The analyses were based on a proposed schedule and highest potential level of development contained in the draft EIS. As the project is implemented, the impacts will be evaluated to determine if they fall within the parameters discussed in the draft and final EISs. Any major change in project design would require additional environmental analysis.



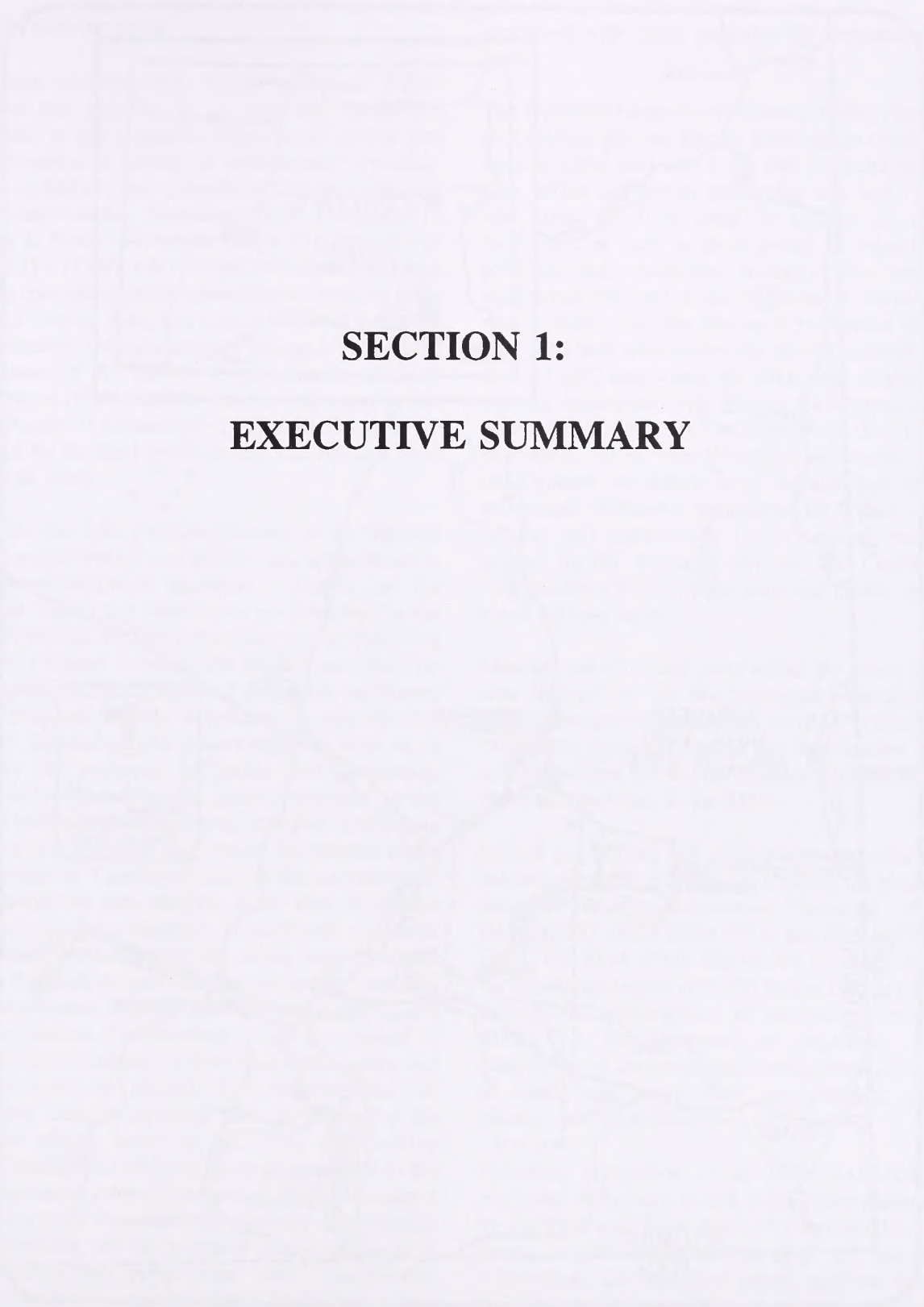


## ABBREVIATIONS

|  |        |
|--|--------|
| Bureau of Land Management (Federal Agency)                 | BLM    |
| Bureau of Reclamation (Federal Agency)                     | BOR    |
| Candidate Species Category 1 and 2                         | C1, C2 |
| Clean Water Act  | CWA    |
| Corps of Engineers   | COE    |
| Council of Environmental Quality                           | CEQ    |
| Cumulative Impact Analysis Area                            | CIAA   |
| Draft Environmental Impact Statement                       | DEIS   |
| Environmental Impact Statement                             | EIS    |
| Environmental Assessment                                   | EA     |
| Final Environmental Impact Statement                       | FEIS   |
| Fish and Wildlife Service (Federal Agency)                 | FWS    |
| Forest Service (Federal Agency)                            | USFS   |
| National Environmental Policy Act                          | NEPA   |
| National Wildlife Refuge (Federal Agency)                  | NWR    |
| Record of Decision   | ROD    |
| Resource Management Plan                                   | RMP    |
| Right(s)-of-way  | ROW(s) |
| State Historic Preservation Office (State Agency)          | SHPO   |
| Surface Management Agency                                  | SMA    |
| U.S. Department of the Interior (Federal Department)       | USDI   |
| Visual Resource Management Classification                  | VRM    |
| Wyoming Oil and Gas Conservation Commission                | WOGCC  |
| Wyoming Game and Fish Department (State Agency)            | WGFD   |
| Wyoming Department of Environmental Quality (State Agency) | WDEQ   |







**SECTION 1:**

**EXECUTIVE SUMMARY**

EXECUTIVE SUMMARY

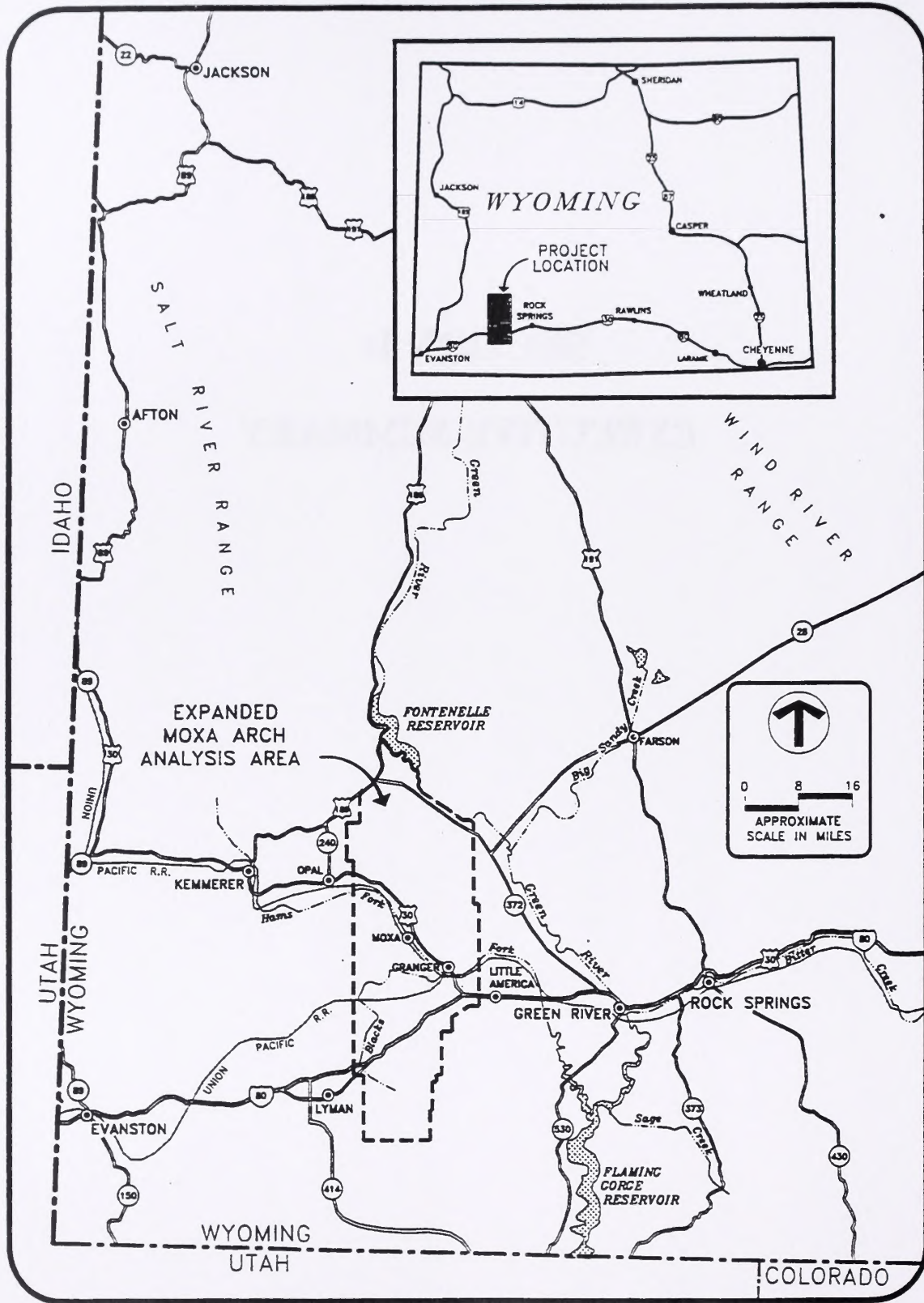


Exhibit 1-1. Area Map - Location of the Moxa Analysis Area in Southwestern Wyoming.



## SECTION 1 - EXECUTIVE SUMMARY

### 1.0 INTRODUCTION

This final environmental impact statement (FEIS) analyzes the impacts of drilling and production operations in the Expanded Moxa Arch Natural Gas Development area (Moxa) of southwestern Wyoming. The Moxa analysis area is located in Lincoln, Uinta, and Sweetwater counties, Wyoming within Townships 15 through 23 North (T15-23N), Ranges 111 through 113 West (R111-113W), 6th Principal Meridian. The Moxa analysis area encompasses approximately 476,261 acres of mixed federal, State, and private lands. Of this total, approximately 230,403 acres are managed by the U.S. Department of the Interior (USDI) Bureau of Land Management (BLM), 31,665 acres are managed by the USDI Bureau of Reclamation (BOR), 13,504 acres are managed by the State of Wyoming, and 200,689 acres are private lands.

This FEIS has been prepared pursuant to the National Environmental Policy Act (NEPA) and is presented in an abbreviated-format document. Details on the Proposed Action and alternatives are described in the DEIS (USDI-BLM 1995) according to the following chapters. **Chapter 1** defines the Purpose and Need for the proposed project. **Chapter 2** details the parameters of the Proposed Action, Alternative A, and the "No Action" alternative (Alternative B), as well as a summary of proposed mitigation and monitoring measures to avoid or reduce impacts proposed by the Moxa Operators (the Operators). **Chapter 3** discusses the areas and resources that would be affected under each alternative. **Chapter 4** examines the environmental consequences to each resource under each alternative and also provides a summary of additional mitigation measures by resource discipline which were identified during the analysis process. The mitigation measures and requirements describe how implementation of the Proposed Action or alternatives should be managed to ensure minimal impacts in the Moxa analysis area and adjacent lands. In general, it is expected that all anticipated impacts resulting from implementing the proposed project could be effectively and feasibly reduced (mitigated) with the measures presented in the mitigation summaries of Chapters 2 and 4. **Chapter 5** provides a short discussion and summary of mitigation and monitoring for the proposed project. **Chapter 6** summarizes the consultation and coordination accomplished with various federal, State, county, and local agencies, elected representatives, environmental and citizen groups, industries, and individuals potentially

concerned with issues regarding the proposed drilling action.

The Proposed Action would increase drilling production in the Moxa analysis area by allowing the Operators to develop 1,325 well sites in the next ten years (610 well sites within the proven production area and 715 well sites from the flank area) in addition to existing operations, as well as development of related roads, pipelines and production facilities. The other two alternatives analyzed in the DEIS are 1) Alternative A which would allow the Operators to develop 795 well sites (610 well sites within the proven productive area and 185 well sites within the flank area) in addition to existing operations, with related roads pipelines, and production facilities and 2) Alternative B, the No Action alternative, which would disallow any further gas/oil development on federal lands beyond that currently authorized. Additional Application for Permits to Drill (APDs) and right-of-way (ROW) actions would be granted by the Wyoming Oil and Gas Conservation Commission (WOGCC) for State and private lands on a case-by-case basis.

Management of federal lands within the Moxa analysis area is provided by the Kemmerer Resource Area (KRA) Resource Management Plan (RMP) (USDI-BLM 1986). The proposed natural gas development project and alternatives are in conformance with management objectives provided in the RMP.

Natural gas drilling and development activities within the Moxa analysis area are authorized by the Moxa Arch Environmental Assessment/Decision Record (MAEA/DR) (USDI-BLM 1991), and the Supplemental EA (USDI-BLM 1992). The BLM's DR and Finding of No Significant Impact (FONSI) for the 1991 MAEA/DR allowed the authorization of necessary permits and ROWs for the Operators to implement various components of the natural gas development project such as access road construction, gas gathering pipeline systems, and other associated facilities.

Following completion of the 1991 MAEA/DR, 149 additional wells were drilled in the Moxa analysis area by the Operators from June 1991 through July 1992. Based on this additional drilling and production information, the Operators gained approval from the WOGCC in January 1992 to develop the Frontier Formation with four wells per section rather than the previous two wells per section. This spacing allowed the



## EXECUTIVE SUMMARY

---

Operators a more efficient and economical development of the natural gas reservoir, without drainage or depletion of adjacent wells. This request resulted in additional wells being drilled in the Moxa analysis area at a concentration level not analyzed in the 1991 EA/DR.

As a result of the approved down-spacing request by the WOGCC, the BLM approved a supplement to the 1991 MAEA/DR to analyze the effects of the increased well density to ensure that no unnecessary or undue degradation would occur that could not be mitigated. The supplemental EA was approved in July 1992.

From August 1992 until the present, approximately 250 additional wells were drilled in the Moxa analysis area. Currently, approximately 1,119 wells have been drilled, approximately 957 of which are producing within the Moxa analysis area.

Drilling attempts within the current productive area and adjacent lands within the Moxa analysis area have been successful. This has resulted in a request to the BLM by the Operators for an increase in the level of drilling and production activity on lands not analyzed in the previous two analyses. Also, an expansion area should be added (DEIS Exhibit 1-3) due to the potential for further drilling success on the flank areas of Moxa and because the Church Buttes Field south of Interstate 80 (I-80) is part of the Moxa Arch development.

The BLM has advised the Operators that an EIS would be required in view of the Operators' plans to drill additional in-fill locations and construct ancillary facilities within the Moxa analysis area in 1995 and beyond at levels not evaluated in previous analyses.

### 1.1 PROPOSED ACTION AND ALTERNATIVES

#### 1.1.1 Proposed Action

The Proposed Action would provide an optimum development scenario of 1,325 additional production well sites (610 well sites within the proven production area and 715 well sites from the flank area) and related facilities. This scenario would allow Moxa Operators to fully develop natural gas reserves to WOGCC-approved spacing requirements. The precise number of wells, locations of the wells, and timing of drilling would be directed by the success of development drilling and production technology, and economic considerations

such as the cost of development of leases having marginal profitability. This proposed development level also should provide consideration of topographic and environmental limitations within the Moxa analysis area (e.g., restricted accessibility resulting from terrain limitations, areas of crucial wildlife habitat with seasonal restrictions, etc.).

The Proposed Action would be developed within a ten-year planning period from late 1995 through 2005. The development scenario would affect approximately 8,838 acres resulting from pipeline construction (1,458 miles with a 50-ft ROW), 4,823 acres from access road construction (795 miles with a 50-ft ROW), and 6,625 acres from well sites (1,325 well sites with 5.0 acres of disturbance per site) bringing the total disturbance caused by the Proposed Action to 20,293 acres of land (4.3 percent of the Moxa analysis area). This development scenario would involve clearing land and constructing well sites, access roads, pipelines, and associated facilities. The total area of disturbance would be reduced during the production phase through reclamation of disturbances associated with the unused portion of road ROW, pipeline ROW, and drill sites. As such, under the Proposed Action, total disturbance would be reduced from approximately 20,293 acres to approximately 5,691 acres.

The Moxa analysis area is not pristine. The analysis area has been subjected to numerous land-disturbing activities. Existing disturbance in the Moxa analysis area from the construction of existing drill/well sites, roads, pipelines, and facilities was approximately 25,999 acres, or approximately 5.5 percent of the total 476,261-acre analysis area. A large portion of this disturbance has been or is in the process of being successfully reclaimed. Approximately 12,034 acres have remained disturbed due to active facilities (e.g., roads, towns, railroads, etc.) and on-going operations (e.g., mines). Cumulative unreclaimed disturbance with implementation of the Proposed Action would be 17,725 acres (5,691 acres plus 12,034 acres) or 3.7 percent of the analysis area.

#### 1.1.2 Alternative A

Alternative A would provide a reduced-level development scenario of 795 additional production well sites (610 well sites within the proven productive area and 185 well sites within the flank area) in addition to existing operations, with related roads, pipelines, and



## EXECUTIVE SUMMARY

---

production facilities. Implementation of this alternative would involve 477 miles of new road and 875 miles of new gas-gathering pipeline. Construction of this alternative would involve 3,975 acres of drill site disturbance, 2,894 acres of road disturbance, 5,303 acres of pipeline disturbance, and seven acres of compressor station disturbance, for a total disturbance area of approximately 12,179 acres. As with the Proposed Action, a large portion of this area would be reclaimed, thus reducing the total disturbance by 8,762 acres to a total of 3,417 acres. This development scenario would also be completed over the ten-year planning period. Cumulative unreclaimed disturbance with the implementation of Alternative A would be approximately 15,451 acres (12,034 acres plus 3,417 acres), or 3.2 percent of the analysis area.

### 1.1.3 Alternative B - No Action

Alternative B, the "No Action" alternative, implies that the on-going natural gas production activities would be allowed to continue by the BLM in the Moxa analysis area, but the Proposed Action or Alternative A would be disallowed. Additional Applications to Drill (APDs) and ROW actions would be granted by the BLM on a case-by-case basis. Transport of natural gas products would be allowed from those wells within the analysis area that are currently productive. Cumulative disturbance with the implementation of the No Action alternative would be limited to the existing unreclaimed disturbance area of 12,034 acres plus unreclaimed disturbance areas associated with potential development on private and State lands, or approximately 2.5+ percent of the analysis area.

## 1.2 MAJOR IMPACT CONCLUSIONS

The Expanded Moxa Arch Natural Gas Development area proposal could cause direct and indirect, short-term and long-term, and cumulative disturbances of the human and natural environments. Potential environmental impacts that could result from implementation of the Proposed Action and Alternatives A and B are summarized in Section 2.6 of Chapter 2 and detailed in Chapter 4 of the DEIS. A summary of proposed mitigation and monitoring measures to avoid or reduce impacts as committed by the Moxa Operators are presented in Chapter 2. Chapter 4 presents the results of the environmental impact analysis for each resource discipline. The following sections summarize the results of the environmental impact analysis by

resource discipline. The commitment to apply mitigation is to federal lands; private and State lands may not have the same level of protective measures. Because 45 percent of the analysis area contains private and State lands, impact avoidance or reduction can be assured only on federal land. Not implementing mitigation measures on all lands affected could result in increased severity and magnitude of impacts summarized below. Chapter 4 provides additional discussion in regard to differential application of mitigation and resultant impacts for each resource discipline.

### 1.2.1 Range Resources and Other Land Uses

Impacts on range resources would involve loss of livestock forage, potential for livestock loss through theft or vehicular collision, and the introduction of weed species. Most of these impacts would be short term, lasting only as long as construction activities were ongoing. Implementation of the Proposed Action would initially remove approximately 1,590 animal unit months (AUMs) of forage from production during drilling, access road, and pipeline construction (short-term loss of forage). Following reclamation and re-establishment of suitable range forage, approximately 265 AUMs would be lost through the ten-year planning period. This would be a reduction of less than one percent of the current livestock forage use in Moxa analysis area. The forage production removed under Alternative A is approximately 948 AUMs in the short term (initial construction and production phases). Following reclamation, approximately 158 AUMs would be lost through the ten-year planning period. The conditions described in DEIS Chapter 3, Affected Environment would generally remain unchanged under Alternative B (No Action) on federal lands. Once production operations are underway and reclamation measures completed, impacts to livestock operations would be minimal. With implementation of the mitigation measures proposed by the Moxa Operators (DEIS Chapter 2), and stipulations in the RMP, impacts to range resources and other land uses can be avoided or reduced to acceptable levels.

### 1.2.2 Air Quality

Extensive analyses were performed to determine potential direct, indirect and cumulative air quality impacts from the Proposed Action or Alternative A and related natural gas development projects (as summarized in Appendix A and detailed in the technical support



## EXECUTIVE SUMMARY

document entitled "Cumulative Impact Analysis of Southwestern Wyoming Natural Gas Development Projects on Air Quality"). The Forest Service reviewed the technical support document and conducted independent analysis on emission scenarios (USDA-Forest Service letter dated May 28, 1996). This information is also summarized in this FEIS.

Although some deterioration of air quality would occur, localized ground level impacts would not be significant. Potential impacts to Air Quality Related Values (AQRVs), particularly extremely sensitive high mountain lakes and visibility, are predicted to be significant. Short-term, local air quality degradation would occur due to site preparation and construction activities (involving particulate matter, sulfur dioxide, and hazardous air pollutants). Long-term, cumulative air quality degradation (due primarily to carbon monoxide and nitrogen dioxide emissions, and potential ozone formation) would occur primarily due to compressor engine, dehydrator, separator, and storage tank operation. Findings of the extensive analyses include:

- Construction and operation would meet all applicable National Ambient Air Quality Standards (NAAQS) and Wyoming Ambient Air Quality Standards (WAAQS).
- Potential emission levels would comply with applicable Prevention of Significant Deterioration (PSD) Class I and Class II Increments.
- Pollutant concentrations during operation would not "overlap" between well locations, even with the densest assumed well spacing. That is, the maximum ground-level concentrations occurred sufficiently close to each well that adjacent wells contributed insignificant amounts to the overall maximum concentration.
- Construction and operation impacts would be below applicable significance criteria for atmospheric deposition in lake ecosystems with an Acid Neutralizing Capacity (ANC) above 25 microequivalents per liter. Impacts would exceed applicable significance criteria in lakes with ANC's less than 25 microequivalents per liter.

- Assuming the "worst-case" emissions scenario and eliminating days exceeding an average relative humidity of 68% and applying a threshold of 1.0 deciview (10% change to ambient conditions), operation would result in a perceptible visual range reduction on twenty-six days annually. Under the "less conservative" emissions scenario, no days exhibit significant visual range reduction. For the same development scenario, but with 2% of the days eliminated for relative humidity and a threshold of 0.5 deciview (5% change to ambient conditions), the Forest Service has estimated a perceptible change in visibility on 153 days. Under the "less conservative" emissions scenario, 18 days would exhibit significant visual range reduction.

The "worst case" emission scenario represents an upper bound which would not be exceeded. Review of current production activities in the area suggests this level of emissions and impacts would not be reached (representing the "less conservative" emissions scenario). For example, the "worst case" emissions scenario assumes: 1) all of the potential sites become producing wells (e.g.; no "dry holes"), 2) all producing wells would be operational for 10 to 20 years, 3) all production activity occurs at its maximum assumed emission rate continuously, and 4) each well will have a dedicated compressor engine, which overestimates the actual number of compressor engines that will be installed.

Also, before development could occur, the Wyoming Department of Environmental Quality requires air quality permits which would examine expected emissions from specific project components (such as compressors) prior to their construction. Additional site specific air quality analysis will be performed, and additional emission control measures may be required, to ensure protection of air quality resources.

### 1.2.3 Transportation

Transportation effects of the Proposed Action and Alternative A would occur primarily on U.S. Interstate 80 (I-80), U.S. Highway 30 (U.S. 30), U.S. Highway 189 (U.S. 189), and Wyoming Secondary Highways 372 (WY 372) and 240 (WY 240). The Proposed Action would generate increases in traffic volumes on highways leading to the analysis area and on county and operator



## EXECUTIVE SUMMARY

---

maintained roads within the analysis area. These increases would result from the movement of workers, equipment and materials to and from the analysis area to perform drilling field development, well service, field operations, and reclamation activities. Additionally, in order to perform the well field development activities associated with the Proposed Action, new access roads would be required. A total of approximately 795 miles of new access roads would be associated with the Proposed Action. Implementation of Alternative A would result in transportation impacts decreased by 60 percent of those described for the Proposed Action. Increase in traffic associated with the Proposed Action and Alternative A would not be significant under the thresholds established for this analysis. Under Alternative B (No Action), current traffic levels on the highways within the analysis area could decline if there is no additional well drilling and field development-related traffic. Transportation conditions under Alternative B would be similar to those described in Alternative A.

The increases in traffic associated with the Proposed Action, and to a lesser degree, Alternative A would create direct impacts when compared to Alternative B. These impacts would occur throughout the ten-year drilling program. Due to good condition and excess capacity of the highways within the analysis area, these impacts are not considered significant.

A Road Development Plan has been prepared for the Moxa Arch operators by an engineering consulting firm in consultation with BLM (Appendix B of this FEIS). This plan is intended as a commitment by the operators to a quality assurance/quality control program for the location, design, construction and maintenance of roads required for expansion of operations on public lands within the Moxa Arch area. Adverse resource impacts due to transportation would be reduced with implementation of the Road Development Plan.

### 1.2.4 Geology/Minerals/Paleontology

Potential for impacts on project facilities due to seismic activity is low, as would be the potential for landslides and road subsidence that would temporarily close access roads. No significant impacts to important surface resources or other mineral resources would occur under the Proposed Action. Adverse interaction between oil and gas exploration and development and trona mining in the Moxa analysis area could result from the

proposed project. Adverse effects could include the intrusion of natural gas into trona mining operations. The BLM has recently established a cementing policy (in consultation with the WOGCC, the Petroleum Association of Wyoming (PAW), and the Moxa Operators--see Chapter 2), that would reduce the potential occurrence of such an adverse effect.

Implementation of the Proposed Action and Alternative A would result in the construction in and excavation of surface and bedrock associated with the development of well pads, access roads, pipelines and other production facilities which could directly result in the exposure and damage or destruction of scientifically significant fossil resources. The potential magnitude of impact on fossil resources associated with the action alternatives (the Proposed Action and Alternative A) would vary proportionally with the total number of wells which would be developed under each alternative. The magnitude of impact for Alternative B (No Action), which would allow additional APDs and ROW action on a case-by-case basis, is unknown at present and would depend on the specific action taken and the specific area involved.

Mitigation measures discussed in Chapters 2 and 4 should reduce potential impacts to mineral/paleontologic resources. Beneficial impacts under the action alternatives include the unanticipated discovery of previously unknown fossils which could occur as a result of construction anywhere in the analysis area. Implementation of the No Action alternative could cause a failure to recover the federal natural gas resource.

### 1.2.5 Soils

Successful reclamation is a challenge in the Moxa analysis area due to low precipitation, high evaporation, shallow and rocky soils, and high salinity and alkalinity levels. The Moxa analysis area is not pristine and has been subjected to approximately 25,999 acres of cumulative soil disturbance from construction activities. However, a large portion of this area has been reclaimed or is in the process of being reclaimed leaving an approximate total unreclaimed area of 12,034 acres or 2.5 percent of the Moxa analysis area.

Potential impacts resulting from drill pad, access road, facility site, and pipeline ROW construction could include removal of vegetation, exposure of the soil, mixing of soil horizons, soil compaction, loss of topsoil



## EXECUTIVE SUMMARY

---

productivity, and increased susceptibility of the soil to wind and erosion resulting in difficult reclamation. Soil erosion could result in sedimentation of stream channels. Implementation of the Proposed Action and Alternative A would initially affect 20,293 acres and 12,179 acres of soils, respectively, during project construction. This would represent approximately 4.3 percent and 2.6 percent of the analysis area for the Proposed Action and Alternative A, respectively. Alternative B, the No Action alternative, could continue to add to the existing disturbance in the Moxa analysis area as APDs are granted by the BLM. Prime farmlands and farmlands of State and local importance would not be affected by the proposed project, as no such areas occur in the analysis area. Reclamation efforts during well production would reduce impacts of the Proposed Action to 5,691 acres, and 3,417 acres for Alternative A.

A large portion of the Moxa analysis area falls into a sensitive soil category, providing limitations to road and facilities construction, rapid to very rapid runoff potential, and severe to very severe wind and water erosion potential. Although sensitive soils cannot be totally avoided, steep slopes greater than 25 percent, badlands, sand dune soils, and soils with high water tables and/or which are subject to inundation should be avoided. These impacts could be kept to non-significant levels with application of mitigation measures proposed in Chapter 2 and reclamation guidelines presented in Appendix B, as appropriate.

### 1.2.6 Water Resources

Construction of drill sites, access roads, pipelines, and ancillary facilities under the Proposed Action and Alternative A could cause increased surface water runoff and off-site sedimentation due to soil disturbance and erosion; increased salt loading and water quality impairment of surface waters; changes in stream discharge due to project disturbance; changes in groundwater levels, quantity, and quality; and channel morphology changes due to road and pipeline crossings. Under Alternative B, water resources within the Moxa analysis area would remain as described in the Affected Environment (Chapter 3); however, an unknown magnitude of additional development above the existing condition could occur as additional individual APDs were approved.

The magnitude of impacts to water resources would depend on the proximity of the disturbance to the

drainage channel, slope aspect and gradient, degree and area of soil disturbance, soil character, duration of time within which construction activities would occur, and the timely implementation of mitigation measures. Impacts would likely be greatest shortly after the start of construction activities and would likely decrease in time due to natural stabilization, reclamation, and revegetation efforts. The Proposed Action would require approximately 2,195 acre-feet (ac-ft) of water over the ten-year planning period or 220 ac-ft per year for construction, pipeline tests, and well completion activities. Alternative A would require approximately 1,317 ac-ft over the ten-year period or 132 ac-ft per year. The proposed project could result in effects on trona mining in the analysis area due to mixing of groundwater of varying quality and intrusion of natural gas into trona mining operations. Mitigation measures discussed in Chapters 2 and 4, measures and guidelines presented in Appendices A and B, and other mitigation measures outlined in the Soils and Vegetation sections should acceptably reduce impacts to water resources.

### 1.2.7 Fisheries

Although the intermittent tributary drainages in the Moxa analysis area do not support fish populations, the Proposed Action and alternatives have the potential to affect fisheries resources and associated values downstream in the Hams Fork, Blacks Fork, Smiths Fork, and Green rivers. The principal fisheries impacts likely to be associated with the Proposed Action and alternatives include increased stream sedimentation, downstream water pollution from accidental discharge of toxic substances, and water flow depletions from the perennial rivers. However, given the avoidance and mitigation measures proposed by the Moxa Operators and those described in the RMP, no significant impacts are expected.

### 1.2.8 Vegetation/Wetlands

Direct impacts would include the short-term loss of vegetation (modification of structure, species composition, and areal extent of cover types). Indirect impacts would include the short-term and long-term increased potential for weed invasion, establishment, and expansion; exposure of soils to accelerated erosion; shifts in species composition and/or changes in vegetative density; reduction of wildlife habitat, and changes in visual aesthetics.



## EXECUTIVE SUMMARY

---

Implementation of the Proposed Action and Alternative A would initially affect 20,293 acres and 12,179 acres of various vegetation cover types, respectively, during project construction. This would add to the existing 12,034 acres of existing unreclaimed disturbance in the Moxa analysis area. Direct impacts include the short-term loss of vegetation (modification of structure, species composition, and areal extent of cover types). Indirect impacts include the short-term and long-term increased potential for weed invasion, establishment, and expansion; exposure of soils to accelerated erosion; shifts in species composition and/or changes in vegetative density; reduction of wildlife habitat; and changes in visual aesthetics. Under Alternative B (No Action), vegetation would continue to be impacted as some APDs are granted by the BLM on a case-by-case basis. Except for waters of the U.S., a reduction in vegetation density would not be significant because upland vegetation types are relatively common, cover large areas, have wide distribution and occur with high frequency within the analysis area. (See Section S.2.10 for effects on special status plant species.) Although project implementation could potentially impact the area and functions of wetlands, measures imposed by the RMP and the federal Clean Water Act (CWA) Section 404 permitting process would prevent or avoid impacts to jurisdictional wetlands and other special aquatic sites. Given implementation of Chapter 2 measures and mitigation, no significant impacts are anticipated. Reclamation would be accomplished according to a site specific reclamation and revegetation plan that uses best management practices (BMPs).

### 1.2.9 Wildlife

The principal impacts on wildlife likely to be associated with the Proposed Action and alternatives include 1) the displacement of some wildlife species, 2) loss of certain wildlife habitats due to the development of drilling and production operations, 3) an increase in the potential for collisions between wildlife and motor vehicles, and 4) an increase in the potential for illegal kill and harassment of wildlife. The severity of these impacts would be expected to decrease with the completion of the construction phase and with the onset of reclamation efforts on many of the disturbed areas.

The nature of impacts to wildlife is identical between the Proposed Action and Alternative A. The magnitude of potential impacts would be greater under the

Proposed Action due to the greater number of well sites and miles of associated access roads.

Implementation of the Proposed Action would result in the short-term loss of approximately 20,293 acres of wildlife habitat over the next ten-year planning period. These habitat alterations would diminish as vegetation becomes re-established along the pipeline ROW, beginning the first fall after wells start producing, and would continue with the subsequent reclamation of abandoned well sites that are no longer productive. With reclamation during the production phase, the total unreclaimed disturbance would be reduced to 5,691 acres. Removal of shrub habitat within the analysis area would represent a long-term loss to those species that depend on such vegetation for forage or shelter.

Similar to the Proposed Action, implementation of Alternative A would result in the short-term loss of approximately 12,179 acres of wildlife habitat over the next ten-year planning period. With reclamation during the production phase, the total unreclaimed disturbance would be reduced to 3,417 acres. Impacts due to wildlife habitat loss would be from 40 (short-term) to 60 (long-term) percent less than with the Proposed Action.

Under the No Action alternative, impacts related to wildlife resources within the analysis area and adjacent lands would be affected through on-going activities as authorized under previous environmental documentation and through unquantified additional development that could occur on State and private lands.

With the implementation of avoidance and mitigation measures presented in Section 2.2.4.2.9 and Section 4.9.6 and adherence to management measures prescribed in the RMP, potentially adverse impacts to wildlife resources would be directly avoided or reduced in severity.

### 1.2.10 Special Status Species

#### Special Status Plants

All project alternatives have the potential to affect special status plant species and habitat. Direct impacts to special status plant species would include death or injury to individual plants and/or loss of habitat due to vegetative clearing and earth-moving activities such as would occur during well site construction, pipeline



## EXECUTIVE SUMMARY

---

placement, or access road construction. Indirect impacts would include the short-term and long-term increased potential for weed invasion, establishment, and expansion; exposure of soils to accelerated erosion; shifts in species composition and/or changes in vegetative density; impacts of fugitive dust on photosynthetic capacity; stream dewatering; or changes in stream channel hydraulics as a result of road or pipeline placement. The latter two could affect Ute ladies'-tresses in particular.

Avoidance of wetlands, barren lands, agricultural lands, and areas with steep slopes would reduce the potential for impacts to Opal phlox, Beaver Rim phlox, and Ute ladies'-tresses orchid, King's milkvetch, spinyleaf milkvetch, Eastwood plant, desert cryptantha, Swallen mountain ricegrass, Payson beardtongue, and dense twinpod. Such efforts at avoidance, however, could potentially increase the impacts to special status plant species found in non-sensitive soils within the mixed desert shrub cover type (i.e., contracted Indian ricegrass) and areas of alkali scrub (i.e., large-fruited bladderpod) as well as species such as spinyleaf milkvetch and desert cryptantha that are found on sandy soils. The magnitude of such impacts cannot be defined without site-specific information on the location of proposed facilities or site-specific surveys for rare plants/habitats.

Given compliance with the Endangered Species Act (ESA) and the RMP, implementation of measures identified in Chapters 2 and 4, and any additional measures identified by the BLM following surveys of facilities location sites, significant direct impacts to special status plant species are not anticipated. Implementation of mitigation measures to prevent/reduce fugitive dust and the potential for noxious or undesirable weed introduction and spread in areas of potential habitat would minimize the potential for negative indirect effects. With implementation of the clearance requirements for threatened, endangered, and candidate species, the Proposed Action and Alternative A are not likely to affect threatened or endangered species or contribute to the need to list candidate plant species.

### Special Status Animals

Three wildlife species listed as endangered by the U.S. Fish and Wildlife Service (FWS) under the ESA have the potential for occurrence in the analysis area. These include the black-footed ferret, bald eagle, and peregrine falcon. In addition, eight candidate species have the

potential for occurrence in the analysis area: Preble's shrew, pygmy rabbit, white-faced ibis, ferruginous hawk, mountain plover, long-billed curlew, black tern, and loggerhead shrike. The burrowing owl, a species listed as Rare by the Wyoming Game and Fish Department (WGFD), could also have the potential for occurrence in the analysis area.

With the implementation of either the Proposed Action or Alternative A, direct loss of potential habitat would result from surface disturbance associated with the construction of well sites and related access roads and pipelines. In addition, some wildlife species would be indirectly impacted by displacement from habitats in the vicinity to the analysis area due to the presence of human activities associated with the construction and operation of wells. The potential for collisions between wildlife and motor vehicles would also increase due to the construction of new roads and increased traffic levels on existing roads. The severity of these impacts would be expected to decrease with the completion of the construction phase and with the onset of reclamation efforts on many of the disturbed areas.

No adverse impacts to listed wildlife species are expected given the implementation of avoidance and mitigation measures presented in Sections 2.2.4.2.9 and 4.9.6, adherence to management measures prescribed in the RMP, and compliance with the ESA. The Proposed Action and Alternative A are not likely to affect threatened or endangered species or contribute to the need to list candidate animal species.

### Special Status Fish

Potential impacts to fisheries resources include the degradation of surface water quality, an increase in stream flow from surface runoff, and a decrease in stream flow from the consumption of groundwater. However, given the avoidance and mitigation measures described in Chapters 2 and 4, neither the Proposed Action nor Alternative A are likely to affect the listed fish species or contribute to the need to list candidate fish species.

Because the endangered and threatened species are so far removed from the Moxa analysis area, no direct effects to them are anticipated. Although unforeseen, any potential indirect effects that might be created by water depletion impacts would be reduced to non-significant levels through implementation of the "Windy



## EXECUTIVE SUMMARY

---

Gap Process." According to the "Windy Gap Decision" of the FWS (as amended July 5, 1994), any average annual depletion in excess of 125 ac-ft to the upper basin is considered to have a possible effect on the survival and recovery of these endangered species of fish in the Colorado River System. This decision provides for the payment into a conservation fund for annual depletions within the upper Green River basin over 125 ac-ft. Although the flows of many tributaries in the upper basins have been modified, flow in the mainstem Green River is controlled by the Flaming Gorge Reservoir, and the resultant impacts on fish habitat are difficult to access. Therefore, the "Windy Gap Process" was developed to facilitate the calculation of flow depletions on a cumulative basis and the assessment of user fees to promote recovery of these species through monitoring research, habitat manipulation, and fish culture. Since the Proposed Action and Alternative A would require an estimated average annual depletion of 220 and 143 ac-ft per year, respectively, payment to the FWS conservation fund would be required. (The 1993/94 rate was \$12.34/ac-ft.)

### 1.2.11 Visual Resources

Both short-term and long-term impacts to the visual resource could be possible where patterns of area, line, form, color, and texture in the characteristic landscape would be contrasted by drilling equipment, production facilities, and/or construction-related damage to vegetation, topography or other visible features. The severity of impact depends upon scenic quality, sensitivity level, and distance zone of the affected environment, reclamation potential of the landscape disturbed, and the level of disturbance to the visual resource created by the proposed action. In general, impacts would be most severe on sites where mitigation would be difficult and where visual contrasts would be highly visible to potentially large numbers of viewers such as from Fontenelle Reservoir, the Green River, U.S. 30, and I-80. In general, these areas include Visual Resource Management (VRM) Class zones II and III.

Adverse impacts from well construction would occur within the short term due to contrast in line, form, color and textures associated with equipment, surface disturbance, and fugitive dust juxtaposed with the existing landscape. Long-term impacts would result from production facilities, access roads, pipelines, and fugitive dust. When comparing the three alternatives, it was assumed that an equal percentage of wells would be

located in the critical I-80, U.S. 30, and WY 189 viewsheds. Impacts would be greatest under the Proposed Action because the largest number of wells, roads and pipelines would be associated with this action. Thus the largest area of disturbance would result from implementing the Proposed Action. The Proposed Action would produce significant impacts if all potential well locations were developed in the Class II and Class III zones. Impacts in the Class IV zone would not be considered significant.

Impacts associated with Alternative A would be substantially lower than those of the Proposed Action. Whether or not these impacts would also be considered significant would depend upon how many wells would be drilled in Class II and III VRM zones. Any wells drilled in Class II that are not screened and more than two wells per square mile in Class III would constitute a significant impact unless screened from view.

Impacts associated with the No Action alternative could be considerably less than those of the Proposed Action. Impacts associated with any well site development in Class II areas would be considered significant unless they were screened from view. Impacts in Class III areas would not be considered significant unless well densities exceeded two well sites per square mile.

### 1.2.12 Noise

Implementation of the Proposed Action and alternatives has the potential to create noise-generated impacts that emanate from machinery utilized during the construction of drill sites, pipelines, access roads, and ancillary facilities, and from the operation of heavy trucks and related equipment. Given the low human population densities in the Moxa analysis area, construction and development operations under the Proposed Action and alternatives would be sufficiently distant from residences that none would likely be affected by construction or development operations. Overall noise produced by construction and support services equipment during peak activity periods would be moderate because of its dispersed and short-term nature. Implementation of mitigation measures in Sections 2.2.4.2.12 and 4.12.6 should fully mitigate or reduce all noise impacts to levels not considered significant.



## EXECUTIVE SUMMARY

---

### 1.2.13 Recreation

Well drilling, testing and production operations, and associated site preparation and construction activities such as those proposed for the Moxa analysis area have the potential to cause alterations to the recreation setting and recreation opportunities available to persons using the area. Some recreationists could be temporarily or permanently displaced from using certain locations associated with drilling and production activities. Displacement of recreationists could also result from changes in the numbers or distribution patterns of wildlife that attract hunters and wildlife observers to the area. Conflicts could develop between an increased number of workers associated with natural gas production and hunters in regard to hunters' stray bullets and/or arrows. The presence of construction and drilling equipment and associated increased evidence of human industrial activities in the area could reduce opportunities for recreationists seeking to experience solitude and isolation from human activity. Such changes could also result in displacement or redistribution of recreationists who would choose to avoid such conditions, as well as reduced satisfaction among others who might continue to engage in recreation activities in the area.

The impact of drilling and construction on the recreation resource under the Proposed Action would involve the temporary displacement of some hunters; particularly during the pronghorn season when use is highest. Theoretically, many hunters could relocate to other hunting areas within or near the Moxa analysis area. However, the number of proposed mineral extraction activities in the region would make relocating increasingly difficult over time for hunters seeking solitude and isolation as part of their outdoor experience. In addition, anglers recreating on Fontenelle Reservoir and the Green and Hams Fork rivers could also be adversely impacted if drilling occurs within the viewsheds of these recreation sites.

Short-term impacts associated with drilling activities could also contribute to a deterioration of the experience of non-consumptive backcountry recreationists who may continue to use the area. These impacts would be most pronounced if drilling activities were scattered throughout the field during the ten-year planning period.

Overall, these impacts would not be considered significant at any one drilling site due to the short-term

nature of project activities. However, when considering the increased level of activity within the entire 748 square-mile Moxa Arch Field, there could be a deterioration in the quality of the recreation experience throughout the area by the year 2005.

Production and storage facilities would remain once drilling was completed. The visible presence of these facilities and activities could have a negative impact on some hunters and backcountry users. These impacts would be similar to those discussed as short-term impacts and could lead to user displacement. Increasingly limited opportunities for recreationists to relocate into suitable nearby areas would increase the potential for recreationist dissatisfaction. As noted in Chapter 3, the improved access to backcountry locations associated with an increase in road density could attract a larger proportion of the hunter population seeking easier access into the Moxa analysis area. Impacts described above would persist for the life of the project.

Neither the Proposed Action nor the No Action alternative would have significant adverse impacts on recreation resources given measures in Chapter 2 (particularly Visual Resource Mitigation) and the RMP (USDI-BLM 1986) stipulations.

### 1.2.14 Socioeconomics

Implementation of the Proposed Action or Alternative A has the potential to create primarily positive socioeconomic impacts that could offer: 1) continued levels of employment in the regional oil and gas industry; 2) economic benefits in other sectors of the regional economy stemming from employee and industry spending; and 3) a source for generating additional tax revenues.

The Proposed Action would provide continued employment for local residents currently employed in the oil and gas drilling and field service industry. It is anticipated that the existing industry would be able to accommodate the Proposed Action based on past and current levels of oil and gas drilling and production activity and observed employment trends in the region. Since no in-migrant population is expected to result from the Proposed Action, no impact on local housing conditions is anticipated. The Proposed Action is also not anticipated to place additional demands on local government facilities or services. Additional tax revenues generated by the Proposed Action are



## EXECUTIVE SUMMARY

---

anticipated to be substantial. Therefore, potential socioeconomic impacts associated with the Proposed Action are largely positive and not significant according to the thresholds used for this analysis.

Implementation of Alternative A would result in similar socioeconomic impacts as described for the Proposed Action. The number of local drilling, service and operations workers employed in the area would be reduced. Tax revenues for federal, State and local governments would be reduced due to the reduction in the number of wells drilled and the associated reduction in facilities and production of natural gas. The estimated reduction in sales and use tax revenues for each jurisdiction compared to the Proposed Action would be: Lincoln County (-29 percent); Sweetwater County (-48 percent); Uinta County (-45 percent); and the State of Wyoming (-40 percent). This alternative would also reduce the amount of state severance tax revenues, State and federal mineral royalties and ad valorem revenues (compared to the Proposed Action). The estimated reduction in Wyoming severance tax revenue and State and federal mineral royalties would be about 41 percent. The estimated reduction in total ad valorem tax revenues for each taxing entity in the three counties would be: Lincoln County (-30 percent); Sweetwater County (-51 percent); and Uinta County (-47 percent).

Implementation of Alternative B (No Action), would likely result in a reduction in employment in the oil and gas sector of the regional economy assuming no other, unassociated oil and gas development occurs within southwest Wyoming. A reduction in the area population would also be likely. The various sales and use tax, severance tax, mineral royalty, and ad valorem tax revenues associated with the Proposed Action and Minimum Development alternative could be lower, and the decline in Uinta County assessed valuation could continue.

### 1.2.15 Cultural Resources

The Moxa analysis area cultural resource database includes 2,994 sites, consisting of both prehistoric and historic components. The population of known prehistoric sites in the analysis area consists mostly of open camps and lithic scatters. Known historic site types within the analysis area include stock-herding sites, trails/highways, ranches, railroad sites, and urban sites.

Moxa analysis area has a moderate to high site density and, therefore, high archaeological sensitivity. Consequently, impacts to specific eligible or un-evaluated properties may occur with implementation of the proposed action or alternatives. Certain geomorphic situations have a greater archaeological potential than other areas especially in terms of significant cultural resources. These situations include eolian deposits (sand dunes, sand shadows and sand sheets), alluvial deposits along major drainages, and colluvial deposits along the low slopes of badlands and other steep topographic breaks.

Although the Moxa analysis area has a high degree of archaeological sensitivity, impacts to cultural properties would not be significant. Potential impacts to known and anticipated cultural resources can be alleviated through mitigation measures outlined in Chapter 2 and Chapter 4 of this EIS. With implementation of mitigation measures discussed in Chapters 2 and 4, no significant impacts to cultural resources would occur in the analysis area.

### 1.2.16 Health and Safety

Hazards associated with the drilling program, including construction and operation, are hazards normally associated with heavy construction and industrial work. Potential risks associated with the oil and gas extraction industry, including impacts from road, drill site, and pipeline construction, drilling operations, production operations and project traffic, would mostly be limited to employees and subcontractors. There would be a minor increased risk to the public caused by project implementation resulting from additional drilling and production related traffic in the Moxa analysis area. However, none of these impacts are expected to occur at significant levels. With implementation of mitigation measures in Chapters 2 and 4, no significant impacts should occur with respect to health and safety.

## 1.3 SCOPE OF ANALYSIS

The purpose of the scoping process, as stipulated (40 CFR, Parts 1500-1508), is to identify important issues, concerns, and potential impacts that require analysis in the EIS and to eliminate insignificant issues and alternatives from detailed analysis. A Scoping Statement was prepared and submitted to the public by the BLM on March 11, 1994, requesting input into the proposed Expanded Moxa Arch Area Natural Gas Development



## EXECUTIVE SUMMARY

project. Scoping documents were sent out to the public on the BLM mailing list, as well as to organizations, groups, and individuals requesting a copy of the scoping document. During preparation of the DEIS, the BLM and consultant interdisciplinary team (IDT) have communicated with, and received input from various federal, State, county, and local agencies, elected representatives, environmental and citizen groups, industries, and individuals potentially concerned with issues regarding the proposed drilling action as summarized in DEIS Chapter 6.

Over 300 copies of the DEIS were made available to the public and interested agencies on April 21, 1995 for a 50-day public comment period.

A total of 23 comment letters were received during the comment period. No request for a public hearing was received.

Public issues of most concern were the analysis of the cumulative effects of mineral development on the non-mineral resources of southwestern Wyoming, including wildlife and air quality, was lacking; a regional, cumulative EIS should be prepared before any further development is authorized; land use changes were causing industrialization of southwest Wyoming; and impacts to water quality.

Specific changes in the text of the DEIS are found in Section 2 of this FEIS. Where a response to a comment indicates "see Errata", Section 2 of the FEIS should be consulted for the specific rewording or clarification of the text.

### 1.4 SUMMARY OF CUMULATIVE EFFECTS

The cumulative effects of the two field development alternatives analyzed in this EIS are compared in the following text. The Proposed Action is the projected additional disturbance caused by the implementation of the maximum development program of 1,325 well locations. Alternative A represents a minimum level of additional site disturbance associated with the development of 795 wells.

Cumulative effects are impacts likely to occur due to the proposed project in combination with other on-going activities, recently constructed projects, and projects likely to be implemented in the near future. Cumulative effects are both additive and interactive. Chapter 4

discusses these effects under each resource discipline section. This section identifies the basic existing cumulative disturbance within the Moxa analysis area as a baseline for the analysis presented in Chapter 4 of each resource discipline section.

Taking past, current, and future reclamation into account, the total existing unreclaimed disturbance is approximately 12,034 acres or 2.5 percent of the 476,261-acre analysis area.

Site disturbance resulting from implementation of the Proposed Action and Alternative A would add cumulatively to the degree of disturbance within the Moxa analysis area. The 20,293 acres of short-term impact for the Proposed Action would increase the area of total disturbance within the Moxa analysis area to 46,292 acres, or 9.7 percent of the analysis area. Alternative A would bring the total disturbance to 38,178 acres (8.0 percent).

Successful reclamation of well, road, and pipeline construction activity would reduce the area of long-term disturbance by the Proposed Action to 5,691 acres with a cumulative disturbance of 17,725 acres (3.7 percent). Successful reclamation of Alternative A would reduce its long-term disturbance to 3,417 acres with cumulative disturbance of 15,451 acres (3.2 percent).

Table 2-5 presents a qualitative/quantitative comparison of impacts between the Proposed Action and Alternatives A and B for each resource element. Further details on the type and extent of impacts to each resource are presented in Chapter 4, Environmental Consequences. Additionally, Table 2-5 identifies compliance with applicable guidelines and indicates if impacts would be significant and un-mitigable, significant but mitigable, or non-significant. Only Air Quality and Visual Resources have the potential for significant impacts, even with the mitigation measures presented in this chapter and with measures presented in Sections 4.2.7 and 4.11.7.

### 1.5 AGENCY-PREFERRED ALTERNATIVE

The Proposed Action is the BLM's Preferred Alternative for the Moxa analysis area. This selection is based on the analyses presented in this EIS and incorporates compliance with the RMP and implementation of various mitigation measures. Such measures include the following: 1) proponent-committed project-wide



## EXECUTIVE SUMMARY

---

measures for preconstruction planning and design and specific resources (Section 2.2.4), 2) BLM Standard Mitigation Guidelines and BOR Stipulations for Surface Use at Oil and Gas Well Drill Sites and Access Roads (Appendix A), 3) Reclamation Guidelines (Appendix B), 4) Hazardous Substances Management Plan (Appendix C), and 5) additional mitigation measures recommended in Chapters 4 and 5 for the various resources. The BLM has concluded that these detail a complete listing of practicable measures to reduce environmental harm resulting from the proposed development in the Moxa analysis area. The BLM also feels that the analyses demonstrate that the Proposed Action would meet the requirements of Federal Regulation 43 CFR 3162(a), which directs the Operators to conduct "...all operations in a manner which ensures the proper handling, measurement, disposition, and site security of leasehold production; which protects other natural resources and environmental quality; which protects life and property; and which results in maximum ultimate economic recovery of oil and gas with minimum waste and with minimum adverse effect on ultimate recovery of other mineral resources."





1. INTRODUCTION

The Commission was established in 1991 to study the economic and social conditions of the people of the State of New York. The Commission's report is a study of the economic and social conditions of the people of the State of New York.

The Commission's report is a study of the economic and social conditions of the people of the State of New York. The Commission's report is a study of the economic and social conditions of the people of the State of New York.

**SECTION 2:**

**ADDENDUM AND ERRATA**

The Commission's report is a study of the economic and social conditions of the people of the State of New York. The Commission's report is a study of the economic and social conditions of the people of the State of New York.

The Commission's report is a study of the economic and social conditions of the people of the State of New York. The Commission's report is a study of the economic and social conditions of the people of the State of New York.

2.1. INTRODUCTION

2.2. SUMMARY

The Commission's report is a study of the economic and social conditions of the people of the State of New York. The Commission's report is a study of the economic and social conditions of the people of the State of New York.

The Commission's report is a study of the economic and social conditions of the people of the State of New York. The Commission's report is a study of the economic and social conditions of the people of the State of New York.

The Commission's report is a study of the economic and social conditions of the people of the State of New York. The Commission's report is a study of the economic and social conditions of the people of the State of New York.

The Commission's report is a study of the economic and social conditions of the people of the State of New York. The Commission's report is a study of the economic and social conditions of the people of the State of New York.







## SECTION 2 - ADDENDUM AND ERRATA

### 2.1 INTRODUCTION

The following sections have been prepared in response to public and agency review comments on the DEIS. The Addendum Section, Section 2.2, expands upon the air quality analysis found in the DEIS. This expanded cumulative impact analysis is based upon the reasonably foreseeable implementation of the Moxa Arch, Fontenelle, Stagecoach Draw, Jonah, Wamsutter II, and other projects. The analysis addresses the construction and operation phases of oil and gas development, the details of which are available in a separate Technical Report entitled *Cumulative Impact Analysis of Southwestern Wyoming Natural Gas Development Projects on Air Quality*. In addition, two new exhibits, Exhibits 2-1 and 2-2, have been developed for this FEIS to provide the reader with more accurate information on the sensitive resources in the project area. These exhibits are presented at the end of the Errata Section. The Errata Section, Section 2.3, presents minor changes to the text of the DEIS organized by DEIS sections. Also, three exhibits, Exhibits 2-13, 3-2, and 3-21, have been modified from the DEIS and are presented at the end of the Errata Section.

### 2.2 ADDENDUM

#### 2.2.1 Air Quality

DEIS pages 3-3 through 3-4, Section 3.2 Air Quality/Climate (AFFECTED ENVIRONMENT)

[NOTE: This addendum should be read in the context of Section 3.2.2 of the DEIS and is incorporated as Section 3.2.2 of the FEIS.]

#### 3.2.2 Air Quality

Current and complete monitoring data for ambient air quality are not available for the Cumulative Impact Study Area. However, based on data collected in similar locations, air quality levels are assumed to be in attainment for all National Ambient Air Quality Standards (NAAQS) and State of Wyoming Ambient Air Quality Standards (WAAQS). These data and standards are summarized in Table 3-3.

The estimation of background concentrations is necessary in order to compare potential air quality impacts from the proposed actions with applicable air quality standards. Thus, impacts, for comparison against an applicable standard, are the sum of the modeled impacts from the proposed sources, plus background concentration. It is important that the model predictions, background concentration and applicable air quality standard are for the same averaging time period.

Background pollutant concentration data were provided by the Wyoming Department of Environmental Quality, Air Quality Division (WDEQ/AQD). Background concentrations of carbon monoxide (CO) are taken from representative data collected by WDEQ/AQD and commercial operators, and summarized in the Riley Ridge EIS (BLM 1983). Nitrogen dioxide (NO<sub>2</sub>) and sulfur dioxide (SO<sub>2</sub>) gaseous data were gathered at the La Barge Study Area at the Northwest Pipeline Craven Creek site (Dailey 1995). Ozone data were taken from Bohm, et al, (1995); they represent the mean of 95th percentile maximum 1-hour concentrations.

The particulate data were collected at the Seedskaadee Wildlife Refuge (TSP), and it was conservatively assumed that TSP and PM<sub>10</sub> concentrations are identical. In addition, because the Seedskaadee Refuge measurements were probably not influenced by man made (anthropogenic) emission sources it was assumed that the maximum 24-hour particulate values result from wind blown dust.

To supplement measured NO<sub>2</sub> data, and to verify modeled NO<sub>2</sub> contributions would not violate applicable ambient air quality standards, many NO<sub>x</sub> emission sources in southwest Wyoming were modeled. Measured annual average NO<sub>2</sub> data (Craven Creek) showed background levels of nearly 2 µg/m<sup>3</sup>; the modeled background concentration was approximately 10 µg/m<sup>3</sup>. The modeled predictions are based on potential emissions of all sources operating at maximum capacity simultaneously over an entire year ("worst case," but improbable). By contrast, background measurements result from actual conditions. In conclusion, these two independent estimates of background NO<sub>2</sub> levels complement each other. For purposes of the cumulative analysis, a "worst-case" background concentration of NO<sub>2</sub> of 10 µg/m<sup>3</sup> was assumed.



## ADDENDUM AND ERRATA

No Prevention of Significant Deterioration (PSD) sources exist in the Cumulative Impact Study Area. Several existing, planned and proposed emission sources were also included as "background" sources in the cumulative air quality impact analyses. These sources included:

- Existing (included in Background): South Baxter, UPRC Brady, Patrick Draw, Dripping Rock, Hay Reservoir, Nitchie Gulch, Big Piney La Barge, Hiawatha, N. Evanston, S. Evanston, and Whitney Canyon.
- EIS Prepared but Field not Developed: Jonah Field, Stagecoach, Greater Wamsutter II (GWA II), Mulligan Draw, Creston/Blue Gap, and BTA/Bravo.
- Sources Permitted but not Constructed: FMC, General Chemical, Sweetwater

Methanol, SF Phosphates, Texaco-Table Rock, Texasgulf-Soda Ash, UPRC-Patrick Draw, Wold Trona, Western Gas Resources-Eagles Nest and -Granger, and Williams Field Service-Echo Springs, -Frewen Lake, -Moxa North, -Moxa South, and -Opal NGL Plant.

Two projects were not included as "background" sources in the cumulative impact analysis: Continental Divide and South Baggs. Both of these projects are still undergoing preliminary NEPA analysis and therefore are not "reasonably foreseeable"; including these speculative sources could constitute a "pre-decision" by the Bureau regarding the likelihood of their development.

On DEIS Page 3-6, Table 3-3, Replace with the following:

**Table 3-3. Representative Pollutant Background Concentrations, Wyoming and National Ambient Air Quality Standards.**

| POLLUTANT          | AVERAGING TIME <sup>a</sup> | CONCENTRATION ( $\mu\text{g}/\text{m}^3$ ) | WAAQS ( $\mu\text{g}/\text{m}^3$ ) | NAAQS ( $\mu\text{g}/\text{m}^3$ ) |
|--------------------|-----------------------------|--|------------------------------------|------------------------------------|
| CO                 | 1-Hour                      | 3,500                                      | 40,000                             | 40,000                             |
|                    | 8-Hour                      | 1,500                                      | 10,000                             | 10,000                             |
| NO <sub>2</sub>    | Annual                      | 10 <sup>b</sup>                            | 100                                | 100                                |
| Ozone <sup>c</sup> | 1-Hour                      | 129  | 160                                | 235                                |
| SO <sub>2</sub>    | 3-Hour                      | 132  | 1300                               | 1300                               |
|                    | 24-Hour                     | 43   | 260                                | 365                                |
|                    | Annual                      | 9  | 60                                 | 80                                 |
| TSP                | 24-Hour                     | 45   | 150                                | n/a                                |
| PM <sub>10</sub>   | 24-Hour                     | 45   | 150                                | 150                                |
|                    | Annual                      | 13   | 50                                 | 50                                 |

Source: TRC Environmental Corporation, 1996

Note: <sup>a</sup>Short-term periods reflect maximum measured concentrations.

<sup>b</sup>Maximum measured nitrogen dioxide annual average value was 2  $\mu\text{g}/\text{m}^3$ ; however, a maximum value of 10  $\mu\text{g}/\text{m}^3$  was assumed based on extensive modeling reported in the Air Quality Technical Report.

<sup>c</sup>Ozone data from Bohm, et al, (1995); mean of 95th percentile maximum 1-hour concentrations.



## ADDENDUM AND ERRATA

---

DEIS pages 4-4 through 4-10, Section 4.2 AIR QUALITY (ENVIRONMENTAL CONSEQUENCES)

[NOTE: This addendum should be read in the context of Section 4.2 of the DEIS and is incorporated as Section 4.2 of the FEIS.]

### 4.2 AIR QUALITY

#### 4.2.1 Introduction

Air pollutants are regulated under Federal and State air quality and emission standards and permit requirements established under the Federal Clean Air Act and administered by WDEQ/AQD. An expanded air quality impact analysis report was completed in response to public comment on the DEIS. A summary of the report has been provided in Appendix A. A copy of the entire report may be obtained from the BLM, Rock Springs District Office.

The expanded report did not result in significant changes in the findings of the DEIS relative to localized ground level air pollutant concentrations. No violations of applicable Federal or Wyoming air quality regulations are expected to occur as a result of direct, indirect or cumulative infill drilling project emissions (including construction and operation. Potential emission levels would meet Prevention of Significant Deterioration (PSD) Class I and Class II increment limits. Pollutant concentrations would not significantly "overlap" between well locations, even with the densest assumed well spacing.

Construction and operation impacts would be below applicable significance criteria for atmospheric deposition in lake ecosystems with an Acid Neutralizing Capacity (ANC) above 25 microequivalents per liter. Impacts would exceed applicable significance criteria in lakes with ANC's less than 25 microequivalents per liter.

Given the inherent conservatism in the analysis it is unlikely (but not impossible) operation emissions would cause significant regional haze impacts in the PSD Class I Area. Assuming the "worst-case" emissions scenario and eliminating days exceeding an average relative humidity of 68% and applying a threshold of 1.0 deciview (10% change to ambient conditions), operation would result in a perceptible visual range reduction on twenty-six days annually

(eight days of the non-winter period, and eighteen days during winter). Under the "less conservative" emissions scenario, no days exhibit significant visual range reduction.

The Forest Service (Cooperating Agency), in modeling their limits of acceptable change found for the same development scenario, but with 2% of the days eliminated for relative humidity and a threshold of 0.5 deciview (5% change to ambient conditions), that there could be a perceptible change in visibility on 153 days. Under the "less conservative" emissions scenario, 18 days would exhibit significant visual range reduction.

In reviewing these predicted impacts it is important to understand the assumptions that have been made regarding resource development. In development of this analysis there is a great deal of uncertainty in the projection of specific plans (i.e. number of wells, equipment to be used and specific locations) for resource development for twenty years in the future. All of these factors affect air emissions as well as predicted air quality impacts. This analysis was based on the "worst case": 1) amount of development; 2) equipment necessary to produce the resource to its maximum capacity; 3) well spacing; and 4) assumed source locations.

This "worst case" emission scenario represents an upper bound which would not be exceeded. Review of current production activities in the area suggests that this level of air emissions and impacts would not be reached. Thus the impacts projected in this report should be viewed as a conservative upper bound estimate of potential air quality effects. It is also important to note that before development could occur, the Wyoming Department of Environmental Quality (WDEQ) would require very specific air quality preconstruction permits which must examine project specific air quality effects.

As part of these permits, (depending on source size), WDEQ would require a cumulative air quality impacts analysis. Thus, as development occurs additional site specific air quality analysis must be performed to ensure protection of air quality resources.



## ADDENDUM AND ERRATA

---

### 4.2.2 Resource Management Objectives and Impact Significance Criteria

#### 4.2.2.1 Resource Management Objectives

Management directives provided in the Kemmerer RMP that pertain to the Expanded Moxa Arch Natural Gas Development proposal are as follows:

- The KRA will be managed to protect and enhance air quality through careful planning and coordination with the State of Wyoming. Most specific stipulations will be deferred to the stage where air pollutant emissions permits are issued by the State of Wyoming.
- When sources of air pollutant emissions are proposed, stipulations related to the protection of air quality will be added to BLM authorizations. The BLM will coordinate with the Wyoming Department of Environmental Quality/Air Quality Division (AQD) during the issuance of permits to construct facilities which would be emission sources.
- The BLM will consider the potential impacts of the release of hazardous air contaminants. The accidental release of sour (H<sub>2</sub>S-rich) gas will be given special attention. A contingency plan will be required for APDs in sour gas areas.

#### 4.2.2.2 Impact Significance Criteria

The significance criteria for air quality include state and federally enforced legal requirements to ensure that ambient air pollutant concentrations remain below specified levels. These include the maximum ambient air concentrations shown in Table 3-3, and the Prevention of Significant Deterioration (PSD) increments that limit the amount of pollutant concentration increase that is allowed in certain areas.

Additional significance criteria were used to evaluate potential cumulative "air quality-related value" impacts at down-wind PSD Class I and Wilderness Areas. Potential visibility impacts to seasonal 90th percentile (clean) values were compared to the 1.0 deciview "just perceptible" limit identified by Pitchford and Malm (1994). The Forest Service (May

28, 1996) has established the limit for acceptable change in visibility at 0.5 deciview.

Potential nitrogen and sulfur deposition of 3 and 5 kg/ha-yr, respectively, and a 0.1 pH unit change in lake chemistry were identified as limits of acceptable change by the USDA-Forest Service (Fox et al 1989). In addition, the Forest Service has established limits for acceptable change in lake Acid Neutralizing Capacity (ANC) (May, 28 1996). A limit of "no change" in ANC from man caused pollutants has been established for lakes with existing levels less than 25 µeq/l. A limit of 10 percent change in ANC reduction was adopted for lakes with ANC over 25 µeq/l (Key and Elliott 1996).

#### 4.2.3 Direct and Indirect Impacts

The air quality impacts from the Proposed Action are evaluated separately for three considerations: pollutant emission rates, ambient air pollutant concentrations, and AQRVs.

##### 4.2.3.1 Pollutant Emission Rates

The total pollutant emission rates expected from the construction, rig-up, drilling, completion, testing, and flaring at one well site are shown in Table 4-1 (TRC 1996). Emission rates of all pollutants are smaller than Wyoming and federal threshold levels.

##### 4.2.3.2 Ambient Air Concentrations

The purpose of the near field modeling was to identify the maximum predicted concentrations in the vicinity of the emission sources for comparison with applicable air quality standards and PSD Class II increments. This modeling was performed to quantify potential "worst-case" impacts from particulate emissions and SO<sub>2</sub> emissions during construction, and CO and NO<sub>2</sub> production impacts.

The ISC3 model was used to simulate the transport and dispersion of TSP and PM<sub>10</sub> from traffic on the unimproved lease road, and from the resource road and well pad construction. Detailed emission rates were used along with the Craven Creek meteorological data, to determine the maximum 24-hour TSP and PM<sub>10</sub> concentrations and annual average PM<sub>10</sub> concentration. These emissions are temporary (occur over a 25-day period) during construction and



## ADDENDUM AND ERRATA

**Table 4-1 Maximum Annual Average Emissions Moxa/Fontenelle Construction and Production (tons per year).**

| POLLUTANT        | PRODUCTION<br>EMISSIONS<br>(each well) | CONSTRUCTION<br>EMISSIONS<br>(each well) | MAXIMUM<br>CUMULATIVE<br>EMISSIONS |
|------------------|--|--|------------------------------------|
| TSP              | <1                                     | 8.61                                     | 2,273                              |
| PM <sub>10</sub> | <1                                     | 4.02                                     | 1,061                              |
| VOCs             | 24.57                                  | 0.37                                     | 64,914                             |
| CO               | 8.8                                    | 1.92                                     | 23,250                             |
| NO <sub>x</sub>  | 5.1                                    | 4.62                                     | 13,474                             |
| SO <sub>2</sub>  | <1                                     | 0.30                                     | 79                                 |

Source: TRC Environmental Corporation, 1996

would occur in isolation, without affecting neighboring well sites. The maximum potential concentrations at the public access receptors (including representative background values) would be nearly 15  $\mu\text{g}/\text{m}^3$  (PM<sub>10</sub> annual), 69  $\mu\text{g}/\text{m}^3$  (PM<sub>10</sub> 24-hour), and 111  $\mu\text{g}/\text{m}^3$  (TSP 24-hour). Therefore, both predicted short- and long-term particulate matter concentrations comply with the applicable Ambient Air Quality Standards; defined as 50  $\mu\text{g}/\text{m}^3$  (PM<sub>10</sub> annual), 150  $\mu\text{g}/\text{m}^3$  (PM<sub>10</sub> 24-hour), and 150  $\mu\text{g}/\text{m}^3$  (TSP 24-hour). Since these sources are temporary, PSD increments are not applicable. Total maximum 24-hour concentrations shown are likely to overestimate actual expected concentrations because they assume the maximum modeled concentration would coincide with the maximum measured background concentration. However, these two events would occur under very different meteorological conditions, and would not be expected to coincide.

The maximum short-term (3- and 24-hour) and long-term (annual average) SO<sub>2</sub> emissions are those from the drilling engines used for the 25 day rig-up and drilling campaign. SO<sub>2</sub> concentrations were predicted (using the ISC3 model) for all applicable time periods. These emissions are temporary (occur over a 25-day period) during construction and would occur in isolation, without affecting neighboring well sites. The maximum modeled concentrations (including representative "worst case" background values) would be nearly 183  $\mu\text{g}/\text{m}^3$  (3-hour), 60  $\mu\text{g}/\text{m}^3$  (24-hour), and 11  $\mu\text{g}/\text{m}^3$  (annual). Therefore, both predicted

short- and long-term SO<sub>2</sub> concentrations comply with the applicable Wyoming Ambient Air Quality Standards; defined as 1300  $\mu\text{g}/\text{m}^3$  (3-hour), 260  $\mu\text{g}/\text{m}^3$  (24-hour), and 60  $\mu\text{g}/\text{m}^3$  (annual); the National standards are less restrictive. Since these sources are temporary, PSD increments are not applicable.

The ISC3 model was used to simulate the transport and dispersion of CO from the compressor engines during production. The maximum predicted direct CO impacts are nearly 95  $\mu\text{g}/\text{m}^3$  (1-hour) and 60  $\mu\text{g}/\text{m}^3$  (8-hour), indicating that no concentrations exceed EPA "significant" levels (2,000  $\mu\text{g}/\text{m}^3$  1-hour, and 500  $\mu\text{g}/\text{m}^3$  8-hour). Therefore by definition there is no significant concentration overlap. When these values are added to the assumed background concentrations, they become nearly 3,595  $\mu\text{g}/\text{m}^3$  (1-hour) and 1,560  $\mu\text{g}/\text{m}^3$  (8-hour), complying with the applicable Ambient Air Quality Standards of 40,000  $\mu\text{g}/\text{m}^3$  (1-hour) and 10,000  $\mu\text{g}/\text{m}^3$  (8-hour).

The ISC3 model was used to simulate the transport and dispersion of NO<sub>x</sub> during the highest production phase. This modeling was based on the "worst-case" conservative assumption that each well would have a compressor engine (5.1 tons per year NO<sub>x</sub> emissions). Maximum modeled NO<sub>2</sub> concentrations were determined by multiplying maximum NO<sub>x</sub> concentrations by 0.75, in accordance with standard EPA methodology (Federal Register 60:153, p. 40469, dated Aug 9, 1995). A group of four wells were modeled to determine the potential for interaction of



## ADDENDUM AND ERRATA

emissions. Minimal NO<sub>2</sub> overlap occurred between wells, indicating that the maximum potential NO<sub>2</sub> impacts are those associated with each individual well site (i.e.; no cumulative impact will occur). The maximum predicted direct NO<sub>2</sub> impact was 5.7 µg/m<sup>3</sup>. When this value is added to the assumed representative background concentration (10 µg/m<sup>3</sup>), the resulting predicted maximum total impact is nearly 16 µg/m<sup>3</sup>, below the State and Federal NO<sub>2</sub> ambient air quality standard of 100 µg/m<sup>3</sup>. In addition, the maximum direct NO<sub>2</sub> value (5.7 µg/m<sup>3</sup>) is well below applicable PSD Class II increment of 25 µg/m<sup>3</sup>.

Ozone is formed as a result of photochemical reactions involving ambient concentrations of VOCs and NO<sub>2</sub>. Because of the complicated photochemical reactions involved with the formation of ozone, a nomograph developed from the Reactive Plume Model (RPM) (Scheffe 1988) was used to predict potential ozone impacts. This involves computing a potential VOC to NO<sub>x</sub> emission ratio, and comparing this ratio, and potential VOC emissions to the nomograph. At the predicted ratio (4.8), the nomograph estimates maximum potential ozone concentrations of less than 0.01 parts per million (20 µg/m<sup>3</sup>). When added to a background ozone concentration of 129 µg/m<sup>3</sup>, the total predicted ozone impact is 149 µg/m<sup>3</sup>. This predicted concentration is less than the restrictive Wyoming Ambient Air Quality Standard of 160 µg/m<sup>3</sup>. This concentration is conservative since the nomograph was developed using meteorological conditions more conducive for forming ozone than would be found in southwestern Wyoming.

In addition, emissions rates of several Hazardous Air Pollutants (HAPs) from well production were evaluated, including formaldehyde (approximately 0.44 tons per year), n-Hexane (0.65 tons per year), and Benzene (1.44 tons per year), Toluene (4.06 tons per year), Ethyl Benzene (0.004 tons per year), and Xylene (5.78 tons per year) from the dehydrator, separator, storage tanks, and compressor engine. Screening values for short-term or acute exposure limits for the HAPs were determined by dividing the American Conference of Governmental Industrial Hygienists (ACGIH 1993) Threshold Limit Values (TLV) by a factor of 42 (CMA 1988). This is conservative since only workers would be within 50 meters (164 feet) of a well site, and the TLV would

be directly applicable without a safety factor to account for the sensitive portion of the population or changes in averaging time.

Potential HAP impacts were predicted using an 8-hour averaging time, then compared to the TLV derived screening values. The predicted maximum concentrations (formaldehyde 3 µg/m<sup>3</sup>, n-hexane 101 µg/m<sup>3</sup>, benzene 222 µg/m<sup>3</sup>, ethyl benzene 0.6 µg/m<sup>3</sup>, toluene 630 µg/m<sup>3</sup>, and xylene 896 µg/m<sup>3</sup>) are well below the screening exposure levels (formaldehyde 8.8 µg/m<sup>3</sup>, n-hexane 4,191 µg/m<sup>3</sup>, benzene 762 µg/m<sup>3</sup>, ethyl benzene 10,333 µg/m<sup>3</sup>, toluene 4,476 µg/m<sup>3</sup>, and xylene 10,333 µg/m<sup>3</sup>). These maximum predicted concentrations occur close to the well site (within 50 meters). As the distance from the well increases, the predicted concentrations decrease rapidly.

Long-term (70-year) exposures to suspected carcinogens (benzene and formaldehyde) emissions were made to estimate the incremental risk. These were calculated from EPA unit risk factors for carcinogenic constituents (EPA 1989). The estimated incremental risk was adjusted to account for duration of residency exposure (approximately 9 years), time spent at home (73 percent), and years of production (20). In addition, no residence would be affected by more than 1 well, so there would be no cumulative incremental risk. The incremental carcinogenic risk was computed to be 1.6 X 10<sup>-7</sup> for formaldehyde, and 6.3 X 10<sup>-7</sup> for benzene; both below one in a million (1.0 X 10<sup>-6</sup>).

### 4.2.3.3 Air Quality-related Values

Cumulative impact assessment was also performed to predict potential air quality impacts in the Bridger Wilderness PSD Class I area to satisfy the following objectives:

- Calculate (through a screening analysis) whether the PSD Class I increment for NO<sub>2</sub> would be exceeded.
- Calculate potential nitrate and sulfate deposition (and related impacts) in sensitive lakes.
- To address potential changes in regional visibility.



## ADDENDUM AND ERRATA

Three different groups of sources were modeled:

- Emissions from the "Proposed Action" well field development.
- Other well fields included in background:
  - Existing: South Baxter, UPRC Brady, Patrick Draw, Dripping Rock, Hay Reservoir, Nitche Gulch, Big Piney La Barge, Hiawatha, N. Evanston, S. Evanston, and Whitney Canyon.
  - EIS Prepared but Field not Developed: Jonah Field, Stagecoach, GWA II, Mulligan Draw, Creston/Blue Gap, and BTA/Bravo.
- Other sources in southwestern Wyoming that have undergone New Source Review (NSR) but have not been constructed or are not yet in operation, including sources permitted but not constructed: FMC, General Chemical, Sweetwater Methanol, SF Phosphates, Texaco-Table Rock, Texasgulf-Soda Ash, UPRC-Patrick Draw, Wold Trona, Western Gas Resources-Eagles Nest and -Granger, and Williams Field Service-Echo Springs, -Frewen Lake, -Moxa North, -Moxa South, and -Opal NGL Plant.

It is important to place these modeling results into a proper perspective in terms of the level of conservatism factored into this analysis. The projected impacts reflect "screening" level modeling (a modeling approach that is conservative by design). If the modeling results are less than applicable significance criteria there is no need to perform a more refined analysis. The following conservative assumptions have been incorporated into this analysis.

- All emission units are operating at potential emission rates simultaneously. Given the number of sources included in this analysis (approximately 10,000) the co-probability of such an emissions scenario occurring over an entire year or over a 24-hour time period is extremely small. While this assumption is typically used in such modeling analyses, the resulting impacts will be overstated. It should be noted as the number of sources increases the level of conservatism also increases.

- The ISC3 model utilizes instantaneous straight line plume transport. Thus the model does not account for the actual travel time and distance that a plume would undergo as it is transported from the point of release to the receptors in the Class I area. Because of this assumption the model significantly overestimates the number of times that a plume actually reaches a sensitive receptor (based on a "puff" model analysis, it is likely a plume will impact the PSD Class I Area only fifteen percent of the time). Also, because the model cannot predict the varying route of an actual plume, the travel distance is underestimated and the concentration is overstated. For near field impacts this limitation is not very important, however, for travel distances greater than 50 kilometers (31 miles) this assumption becomes very conservative.
- The complex terrain treatment in the ISC3 model also conservatively addresses plume transport for elevation increases of greater than 4000 feet. Even though a trajectory could transport the plume toward the Class I area, it is doubtful that it would climb 4000 feet necessary to reach the sensitive receptors.

In addition, a "less conservative" emission scenario was developed as a point of comparison to the assumed "worst case" emissions scenario. Review of existing compressor use suggests that after resource development, total emissions would be much less than the assumed "worst case" scenario. It is likely the 320 MMSCFD of additional natural gas capacity under the Proposed Action proposed would require 28,800 horsepower of additional compression. Since compressors are typically added in 225 horsepower increments, this would result in 128 new compressors, as opposed to the 1,325 compressor engines assumed under the "worst case" emission scenario. The "less conservative" emission scenario is approximately eight times less than the "worst case" emission scenario.

The maximum predicted cumulative NO<sub>2</sub> concentration at the Bridger PSD Class I boundary is 0.21 to 0.08 µg/m<sup>3</sup>, reflecting a range between the "worst-case" and "less conservative" emissions scenarios. Therefore, it is unlikely the proposed



## ADDENDUM AND ERRATA

---

action would cause or contribute to exceedances of the NO<sub>2</sub> PSD Class I increment (2.5 µg/m<sup>3</sup>). SO<sub>2</sub> emissions from construction activities do not consume PSD increment. It is important to note that this is not a complete PSD increment analysis, but rather an assessment indicating that increment would not be exceeded. At the time of a pre-construction air quality permit application WDEQ could require a much more detailed analysis.

The maximum predicted cumulative, average SO<sub>2</sub> and NO<sub>2</sub> concentrations were computed using the ISC3 model for specific lake locations within the Bridger/Teton Wilderness Area. The lakes that were chosen are those identified in "Temporal Patterns in the Chemistry of Wind River Lakes and Four NADP/NTN Sites in Wyoming," (Welker 1994), and include Black Joe, Deep, Hobbs, Ross, and Saddlebag. These lakes are those for which the most recent, and most complete, data have been collected. They represent a mix of east- and west-side lakes, all of which are above 3,000 meters (9,842 feet) elevation, and all of which have alkalinities less than 200 µeq/l. These lakes represent a cross-section of "...aquatic ecosystems in this area [that] have little protection from acidic deposition." (Welker 1994).

The U.S. Forest Service has expressed concern regarding Klondike Lake because its ANC is "...very low: 20 microequivalents per liter" (Nelson 1996). Additional nitrogen deposition at Klondike Lake, or any of the other extremely sensitive high mountain lakes identified during the EPA's Western Lakes Survey (1985), with ANC's less than 25 microequivalents per liter, would cause exceedances of the U.S. Forest Service ANC threshold. The Western Lakes Survey ANC measurements are a single measurement, and subsequent measurements of ANC have not been made.

Saddlebag Lake was the most sensitive receptor based on existing lake chemistry, location, and potential SO<sub>2</sub> and NO<sub>2</sub> impacts. Atmospheric deposition at Saddlebag Lake was predicted to be 0.1553-0.0735 kg/ha-yr (nitrogen) and 0.2050 kg/ha-yr (sulfur), compared to threshold values (Fox et al 1989) of 3 kg/ha-yr (nitrogen) and 5 kg/ha-yr (sulfur). Potential pH change in Saddlebag Lake was predicted to be 0.012-0.009 delta pH, well within the threshold of 0.1 pH units. Potential change in Acid Naturalizing Capacity (ANC) at Saddlebag Lake ranged between

2.74 and 2.07 percent; the allowable threshold change is 10 percent for lakes with existing ANC greater than 25 microequivalents per liter.

Since the proposed emissions constitute many small sources, uniformly spread out over a very large area, discrete visible plumes are not likely, but the potential for cumulative visibility impacts (increased regional haze) near the PSD Class I area is a concern. Regional haze or visibility degradation is caused by fine particles and gases scattering and absorbing light. Changes to regional haze are measured in terms of perceptible visibility differences below ambient background conditions.

The Interagency Workgroup on Air Quality Modeling (IWAQM) has prepared a methodology for estimating changes to regional haze (IWAQM 1993). This method involves modeling SO<sub>2</sub>, NO<sub>2</sub>, and particulate emissions to estimate airborne fine particle concentrations at the PSD Class I area, then computing an increase in extinction coefficient over background conditions. This method is called a "deciview change" from a background condition. The magnitude of the deciview change is used as an indicator for increases to regional haze. A deciview change of 1.0, which represents a 10 percent change to ambient conditions, is considered potentially significant. Factors such as magnitude of deciview change, frequency, time of the year, meteorological conditions during times when deciview thresholds are above 1.0, as well as inherent conservatism in the modeling analyses are considered when determining if the impact is significant.

Since the Proposed Action sites are located approximately 100 miles west of the sources that are located on the eastern side of the continental divide, and visibility degradation is a condition caused by persistent meteorological conditions, the sources east of the continental divide were not included in this analysis. The ISC3 model was used to estimate the maximum 24-hour, and annual average pollutant impacts from well field emissions, at receptors along the PSD Class I Area boundary. For this "worst case" scenario, NO<sub>2</sub> is the only pollutant of concern since no sulfur emissions would occur during production. The background visibility was assumed on a seasonal basis using standard visual range (SVR) data provided by the IMPROVE monitoring program. These values for standard visual range are assumed to be the 90th



## ADDENDUM AND ERRATA

---

percentile best-case visibility for each of the four seasons (262 km - winter, 204 km - spring, 191 km - summer, and 224 km - fall).

Results of this analysis for the "worst-case" emissions scenario indicated that there are 26 days when the deciview calculations exceed 1.0. The cumulative frequency distribution of these data indicate 92 percent of the estimates have a predicted deciview of less than 1.0. These data were further examined for the time of occurrence; the 1.0 deciview threshold was exceeded on only 8 days during the non-winter period. Given the inherent conservatism in the analysis it is unlikely (but not impossible) that "worst-case" well field emissions would cause significant regional haze impacts in the PSD Class I Area.

This regional haze analysis was conducted using conservative assumptions regarding emissions, plume transport time, humidity, and the conversion of NO<sub>x</sub> to ammonium nitrate. It was assumed that 75 percent of the NO<sub>x</sub> convert to NO<sub>2</sub> and that 100 percent of the NO<sub>2</sub> converts to nitrate particles. In all likelihood, the amount of NO<sub>x</sub> that converts to ammonium nitrate particles would be significantly less.

Considering the less conservative emissions case, where NO<sub>2</sub> emissions from the well fields would be roughly eight times less than the worst-case scenario, the visibility threshold would not be exceeded at any time.

In the "worst case" (full development) scenario, the *Air Quality Technical Support Document* estimated a perceptible change in visibility an average of 26 days a year when days exceeding an average relative humidity of 68% (117 days) are eliminated and a 1.0 deciview level of acceptability is used. For the same development scenario, and using the Interagency Workgroup on Air Quality Modeling (IWAQM) recommendations, with 2% of the days eliminated for relative humidity and a threshold of 0.5 deciview, the Forest Service has estimated a perceptible change in visibility of 153 days (42% of the year) exceeding the Forest Service criteria for acceptable change of 0.5 deciview. For the less conservative development scenario (1/8 development), the projected adverse visibility impact occurs 5% of the year (18 days). Either Forest Service calculation exceeds their acceptable level of change.

### 4.2.3.4 Impacts of Alternatives

#### 4.2.3.4.1 Proposed Action

Slightly higher carbon monoxide, nitrogen dioxide and ozone levels. No violation of Federal or State standards. Potentially significant cumulative visibility impacts. No exceedances of atmospheric deposition, lake pH or ANC thresholds in lake ecosystems with an Acid Neutralizing Capacity (ANC) above 25 microequivalents per liter. Impacts would exceed applicable significance criteria in lakes with ANC's less than 25 microequivalents per liter.

#### 4.2.3.4.2 Alternative A

Maximum, localized ground level air pollutant concentrations would not differ from those associated with the Proposed Action because each individual well site emissions are the same. Distant air quality-related value impacts would be less than the Proposed Action, although there remains a potential for significant cumulative visibility impacts.

#### 4.2.3.4.3 Alternative B - No Action

Implementation of Alternative B would eliminate the incremental air quality impacts associated with the Proposed Actions and Alternatives. Impacts to air quality from field maintenance activities and on-going drilling activities would persist.

### 4.2.4 Impacts Summary

Although some deterioration of air quality would occur, localized ground level impacts would not be significant. Potential impacts to Air Quality Related Values (AQRVs), particularly extremely sensitive high mountain lakes and visibility, are predicted to be significant. Short-term, local air quality degradation would occur due to site preparation and construction activities (involving particulate matter, sulfur dioxide, and hazardous air pollutants). Long-term, cumulative air quality degradation (due primarily to carbon monoxide and nitrogen dioxide emissions, and potential ozone formation) would occur primarily due to compressor engine, dehydrator, separator, and storage tank operation. Findings of the extensive analyses include:



## ADDENDUM AND ERRATA

---

- Construction and operation would meet all applicable National Ambient Air Quality Standards (NAAQS) and Wyoming Ambient Air Quality Standards (WAAQS).
- Potential emission levels would comply with applicable Prevention of Significant Deterioration (PSD) Class I and Class II Increments.
- Pollutant concentrations during operation would not "overlap" between well locations, even with the densest assumed well spacing. That is, the maximum ground-level concentrations occurred sufficiently close to each well that adjacent wells contributed insignificant amounts to the overall maximum concentration.
- Construction and operation impacts would be below applicable significance criteria for atmospheric deposition in lake ecosystems with an Acid Neutralizing Capacity (ANC) above 25 microequivalents per liter. Impacts would exceed applicable significance criteria in lakes with ANC's less than 25 microequivalents per liter.
- Assuming the "worst-case" emissions scenario and eliminating days exceeding an average relative humidity of 68% and applying a threshold of 1.0 deciview (10% change to ambient conditions), operation would result in a perceptible visual range reduction on twenty-six days annually. Under the "less conservative" emissions scenario, no days exhibit significant visual range reduction. For the same development scenario, but with 2% of the days eliminated for relative humidity and a threshold of 0.5 deciview (5% change to ambient conditions), the Forest Service has estimated a perceptible change in visibility on 153 days. Under the "less conservative" emissions scenario, 18 days would exhibit significant visual range reduction.

The "worst case" emission scenario represents an upper bound which would not be exceeded. Review of current production activities in the area suggests this level of emissions and impacts would not be

reached (representing the "less conservative" emissions scenario). For example, the "worst case" emissions scenario assumes: 1) all of the potential sites become producing wells (e.g.; no "dry holes"), 2) all producing wells would be operational for 10 to 20 years, 3) all production activity occurs at its maximum assumed emission rate continuously, and 4) each well will have a dedicated compressor engine, which overestimates the actual number of compressor engines that will be installed.

Also, before development could occur, the Wyoming Department of Environmental Quality requires air quality permits which would examine expected emissions from specific project components (such as compressors) prior to their construction. Additional site specific air quality analysis will be performed, and additional emission control measures may be required, to ensure protection of air quality resources.

### 4.2.5 Cumulative Impacts

Extensive analyses were performed to determine potential cumulative air quality impacts from the Proposed Action and related natural gas development projects, as summarized in Appendix A and detailed in TRC (1996). Based on the "worst case" analyses, cumulative impacts were limited to the "air quality-related value" discussion in section 4.2.3.3.

### 4.2.6 Mitigation Summary

Assumed mitigation measures are identified in Chapter 2 (Section 2.2.4.2.2).

An evaluation of additional opportunities for NO<sub>x</sub> mitigation (emission reduction alternatives) was conducted as part of the cumulative air quality impact analyses. This evaluation focused on opportunities for reducing NO<sub>x</sub> emissions for natural gas fired internal combustion compressor engines. It is important to note this is not intended to rank or identify which technology is most applicable for the proposed compressors. The appropriate level of control would be determined as part of the air quality preconstruction permitting process required by the Wyoming Department of Environmental Quality (WDEQ). In developing the emission inventory it was assumed that each compressor engine would reflect 75 percent control with an emission of 2 g/hp-hr (uncontrolled emissions are 9-25 g/hp-hr).



## ADDENDUM AND ERRATA

---

### Additional control measures could include:

- **Nonselective Catalytic Reduction.** This control technology is applicable to relatively new engines, and requires the installation of catalysts in the engine exhaust. The catalyst removes between 80 to 90 percent of the uncontrolled NO<sub>x</sub> emissions, for an operating emission rate of 1-5 g/hp-hr. Costs approximate \$110-180/ton removed.
- **Prestratified Charge.** This control technology has been applied to 4-cycle carbureted natural gas engines under 1500 hp, but is limited to selected engines that can accommodate turbocharging and power derate. The controls are between 80 to 90 percent efficient, for an operating emission rate of 5-8 g/hp-hr. Costs are unavailable.
- **Lean Combustion.** This technology involves the increase of the air-to-fuel ratio to lower the peak combustion temperature, thus reducing the formation of NO<sub>x</sub> (new engines and retrofit applications). The controls are between 80 to 90 percent efficient, for an operating emission rate of 1.5-4 g/hp-hr. Costs are \$490-690 \$110-180/ton removed.
- **Exhaust Gas Recirculation.** This control technology employs the recirculation of exhaust gas into the engine cylinder which reduces the formation of NO<sub>x</sub> by reducing the combustion temperature. It is applicable for new engines and retrofit kits. The controls are between 50 to 85 percent efficient, for an operating emission rate of 5-8 g/hp-hr. Costs are \$250-600/ton removed.
- **Selective Catalytic Reduction.** This is a post combustion control technology which is only applicable to exhaust streams with significant oxygen content (a lean burn engine). The controls are between 80 to 90 percent efficient, for an operating emission rate of 1-2.5 g/hp-hr. Costs are \$750-9600/ton removed.

### 4.2.7 Residual Impacts

Other than the impacts described and quantified in Section 4.2.3, there would be no other residual impacts.



**ADDENDUM AND ERRATA**

---

This page intentionally left blank.



## 2.3 ERRATA

This section describes changes to the DEIS prepared in response to public comments. In some cases responses to public comment have been repeated here and incorporated into the FEIS. Where BLM response to a public comment referred the reader to the "errata", this change has been indicated below. Additional changes have been made in the DEIS by the BLM to correct minor errors in the text.

| Page                   | Errata  |               |                         |                      |  |
|------------------------|---|---------------|-------------------------|----------------------|--|
| <b>Summary Chapter</b> |   |               |                         |                      |  |
| S-11                   | S.4 SUMMARY OF CUMULATIVE EFFECTS, Para 6, Lines 9-12. Modify as follows: "Only Air Quality and Visual Resources have the potential for significant impacts, even with the mitigation measures presented in this chapter and with measures presented in sections 4.2.7 and 4.11.7."   |               |                         |                      |  |
| <b>Chapter One</b>     |   |               |                         |                      |  |
| 1-15                   | Table 1-4. Federal, State, and County Authorizing Actions. Add the following under Wyoming Department of Environmental Quality:<br><br><table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;"><u>Agency</u></th> <th style="text-align: left;"><u>Nature of Action</u></th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;">Air Quality Division</td> <td style="vertical-align: top;">Permitting/approval for compression sites, flaring, and other natural gas production and processing facilities; burning of commercial garbage and any other open burning; fugitive dust suppression.</td> </tr> </tbody> </table> | <u>Agency</u> | <u>Nature of Action</u> | Air Quality Division | Permitting/approval for compression sites, flaring, and other natural gas production and processing facilities; burning of commercial garbage and any other open burning; fugitive dust suppression. |
| <u>Agency</u>          | <u>Nature of Action</u>   |               |                         |                      |  |
| Air Quality Division   | Permitting/approval for compression sites, flaring, and other natural gas production and processing facilities; burning of commercial garbage and any other open burning; fugitive dust suppression.  |               |                         |                      |  |
| <b>Chapter Two</b>     |   |               |                         |                      |  |
| 2-5                    | Section 2.2.1 Preconstruction Planning and Site Layout. To the first sentence of the first paragraph, add the following clarification to the first sentence: "In accordance with the requirements of <i>"Onshore Oil and Gas Order No. 1"</i> ; the criteria/standards set forth in the <i>Surface Operating Standards for Oil and Gas Exploration and Development Handbook (i.e., the Gold Book)</i> ; and other site-specific modifications determined during the onsite inspection conducted during the <i>Environmental Review</i> process, the Moxa Arch Operators would ..."  |               |                         |                      |  |
| 2-5                    | Section 2.2.1. Bottom of first bullet is revised to read: "Following the on-site evaluation, the applicant would file the application which would include site-specific construction plans where necessary to describe the proposed development (i.e., drilling plans with casing/cementing program; surface use plan with appropriate engineering design to adequately describe proposed construction, reclamation plans, etc.)."  |               |                         |                      |  |
| 2-8                    | Section 2.2.2.1, right column, 2nd full paragraph, line 6, change to read: "... feasible, the Moxa Operators may use directional or horizontal drilling from a single-well pad (multi-well directional or horizontal drilling) to access ...". Also add to the end of the paragraph: "See FEIS Exhibit 2-2 for approximate location of site occupancy limitation areas or sensitive areas."<br><br>Exhibit 2-2 is a new exhibit and has been added at the end of the Errata section of this FEIS.   |               |                         |                      |  |
| 2-12                   | Section 2.2.2.2 Access Road Construction. Paragraph 8, 1st sentence is modified to read "To provide safe operating conditions at all times, roads would be designed to minimize disturbance and would be built, graveled, and maintained as determined appropriate and agreed to by the BLM and the operator at the time of the on-site evaluation."  |               |                         |                      |  |
| 2-14                   | Section 2.2.2.2 Access Road Construction. 2nd paragraph is modified to read "When necessary, resource roads...."  |               |                         |                      |  |



## ADDENDUM AND ERRATA

| Page | Errata  |
|------|---|
| 2-23 | <p>Section 2.2.3.1 Completion and Testing Operations. Make the following additions to items 2 &amp; 3:</p> <p>"2) If casing is not cemented as described in Item 1 above, then minimum cementing requirements of Onshore Order No. 2 will be required (e.g., cement bottom hole to usually 1,000 feet above the Frontier Formation; place surface casing to ~1,500 feet and cement back to surface) and a Cathodic Protection (CP) system will be installed. The CP system ...".</p> <p>"3) If an operator elects not to do either Items 1 or 2 above, then minimum cementing requirements of Onshore Order No. 2 will be required (e.g., cement bottom hole to usually 1,000 feet above the Frontier Formation; place surface casing to ~1,500 feet and cement back to surface) and the operator may run corrosion logs on selected wells on a ..."</p>  |
| 2-30 | <p>Exhibit 2-13. Typical Abandoned Wellbore Diagram. This exhibit has been corrected. See corrected exhibit at end of Errata section.</p>   |
| 2-33 | <p>Section 2.2.4.1 Preconstruction Planning and Design Measures. The text is modified to read: "...the lead operator (the operator with the greater number of federal wells) will..."</p>   |
| 2-33 | <p>2.2.4.2.2 Air Quality (Mitigation), Paragraph 2. Add the following:</p> <p>2) "...operator from State-approved source(s). The control efficiency of the watering and/or dust suppressant use is computed at 50 percent watering at an (assumed) application rate of 0.02 gallons per square yard."</p> <p>"3) Roads which would be constructed on soils susceptible to wind erosion should be graveled to reduce the amount of fugitive dust generated by traffic. To reduce fugitive dust, oil and gas operators should establish and enforce speed limits for all unsurfaced roads in the Cumulative Impact Study Area. These roads should be identified in the transportation plan."</p>  |
| 2-33 | <p>Section 2.2.4.2.3, Transportation. Add to start of paragraph: "<i>A Road Development Plan for the Moxa Arch Area</i> has been prepared for the Operators (prepared by the engineering consulting firm of D.R. Griffin and Associates, Inc.) in consultation with BLM. As it states under "Purpose", the Plan "... is intended by the Moxa Arch Operators as a commitment to a quality assurance/quality control program for the location, design, construction and maintenance of roads required for expansion of their operations on public lands within the Moxa Arch Area." The Plan details "... the procedures by which transportation planning, road design, construction and road maintenance will be conducted by Moxa Arch Operators to meet their operational needs and Bureau of Land Management requirements for roading standards, safety, and resource protection."</p> <p>(Continued on following page)</p> |



**ADDENDUM AND ERRATA**

| Page          | Errata   |
|---------------|--|
| 2-33<br>Cont. | <p>Section 2.2.4.2.3, Transportation (continued).</p> <p>"Moxa Arch Operators will utilize an extensive network of existing roads in the Moxa Arch Area, much of which is shared with other road users. The incremental infill development of the Moxa Arch field will follow the guidelines provided in the <i>Road Development Plan for the Moxa Arch Area</i>. Transportation planning would consist of the annual review of plans for development between the operator and BLM. The review would entail assessment of existing roads and how the planned incremental well development roads would tie-in to the existing network to ensure safety and protection of natural resource values. As individual APDs are then prepared for submission to BLM, and following on-site inspection, the application will address site-specific considerations relative to safety and environmental protection pertaining to access road location, design, construction and maintenance in accordance with the <i>Road Development Plan for the Moxa Arch Area</i>. Thus BLM intends that transportation planning (e.g., pre-defined road network the company wants to service their field; road layout/location in relation to resource issues; etc.) and access road plans submitted as part of an APD be consistent with the <i>Road Development Plan for the Moxa Arch Area</i> (See Appendix B of this FEIS)."</p>  |
| 2-34          | <p>Section 2.2.4.2.4 Minerals/Paleontology. Change item 1, line 2 to read: "... surveyed by a qualified paleontologist as determined necessary by the AO on a project-by-project ..."</p>  |
| 2-34          | <p>2.2.4.2.5 Soils. Item 4 is modified to read: "Frozen or saturated soils will not be used as construction material."</p>   |
| 2-35          | <p>Section 2.2.4.2.6 Water Resources. Item 10, first sentence, is corrected to read as follows: "Case wells during drilling, and case and cement all wells in accordance with Onshore Order No. 2 to protect high quality water aquifers containing 10,000 TDS or less encountered at any depth. High quality water aquifers are ..."</p>  |
| 2-35          | <p>Section 2.2.4.2.6 Water Resources. Item 11 is corrected to read as follows:</p> <p>"11) Reserve pits will be constructed in cut rather than fill materials or compact and stabilize fill. Inspect the subsoil material of the pit to be constructed in order to assess soil stability and permeability and whether reinforcement and/or lining are required. Earthen reserve pits would be used only after evaluation of the pit location for distance to surface waters, depth to useable groundwater, soil type and permeability, and after evaluation of the fluids which would likely be retained in the pit.</p> <p>All reserve pits would be unlined unless demonstrated they need to be lined based on site-specific conditions during the APD approval process. Bentonite or other synthetic impermeable liners that meet specific competency standards would be used.</p> <p>Situation where a liner may be required include a pit location within 50 feet of natural groundwater; when a well pad is located within the zone of potential impact to a perennial stream, lake, or reservoir; or the location is near a floodplain. A liner will be used in shallow water table areas; groundwater recharge areas; areas with drill sites within 500 feet of stream channels, seeps, springs, and/or internally drained lakes; and/or where reserve pits are constructed in earthen fill (as oppose to cut).</p> <p>(Continued on following page)</p> |



**ADDENDUM AND ERRATA**

| Page          | Errata   |
|---------------|--|
| 2-35<br>Cont. | <p>Section 2.2.4.2.6 Water Resources (continued).</p> <p>If lining is required, line the reserve pit with a reinforced synthetic liner at least 12 mils in thickness and a bursting strength of 175 x 175 pounds per inch (ASTMD 75179). Consideration should be given to use of closed or semi-closed drilling systems in situations where a liner may be required."</p>  |
| 2-35          | <p>Section 2.2.4.2.6 Water Resources. Item 14, last sentence is corrected to read as follows:<br/>"... Coordinate all discharge of test water with the Wyoming SEO, DEQ-WQD, and BLM."</p>   |
| 2-35          | <p>Section 2.2.4.2.6 Water Resources. Item 16, add the following to the paragraph: "DEQ-WQD policy (as modified) provides that a company participating in a field development can either follow the general policy of single well permitting or file notification for coverage of all their wells within the field. The following criteria must be met to obtain full field coverage:</p> <ol style="list-style-type: none"> <li>1. The company must have 20 or more wells proposed for the field development. A listing of all the proposed wells, which includes the legal locations, must be submitted to WQD.</li> <li>2. A PPP must be prepared that describes the characteristics of the field, the specifics of each individual well site, and all erosion, sediment and storm water management practices that will be utilized at each site. Before coverage under the general permit is issued by WQD a PPP for a selected site must be submitted and approved.</li> <li>3. All wells in the field will be subject to the permit requirements, including those that disturb less than five acres."</li> </ol>             |
| 2-36          | <p>Section 2.2.4.2.8 Vegetation and Wetlands. Item 5 has been revised to read:</p> <p>"... 5) A site-specific survey for plant species of concern would be completed by the BLM botanist or other qualified botanist within known or identified potential habitat in the Moxa analysis area prior to initiation of any ground-surface disturbance. If species of concern ..."</p>  |
| 2-37          | <p>Section 2.2.4.2.9 Wildlife. Item 10 has been corrected as follows:</p> <p>"Field evaluations of sage grouse leks and nesting areas would be conducted by BLM or other qualified biologist prior to the start of activities in potential sage grouse habitat between February 1 and July 31. These field evaluations for leks and nesting would be conducted if project activities would occur in potential sage grouse habitat during the specified periods. BLM wildlife biologists would ensure that such surveys are conducted using proper survey methods at the proper time of year.</p> <p>Sage grouse leks would be protected by avoiding surface disturbance within 0.25 miles of a lek between February 1 and May 15. If this is not possible, intensive mitigation of the surface-disturbing activities would be provided such as no placement of permanent and high profile structures such as buildings, storage tanks, overhead powerlines, etc., within 0.25 miles of a lek. Linear disturbances such as pipelines, seismic activity, etc., could be granted exceptions.</p> <p>(Continued on following page)</p> |



**ADDENDUM AND ERRATA**

| Page                 | Errata   |
|----------------------|--|
| 2-37<br>Cont.        | <p>Section 2.2.4.2.9 Wildlife (continued).</p> <p>If an occupied sage grouse nest will be adversely affected by surface disturbing activities, surface uses and activities would be delayed in the affected area until nesting is completed."</p>  |
| 2-38                 | <p>Section 2.2.4.2.16 Health and Safety. Add: "9) Any facilities defined as "critical" by the UBC will be constructed in accordance with applicable UBC standards for Seismic Risk Zone 2B."</p>   |
| 2-42                 | <p>Table 2-5. Comparative Impact Summary (Air Quality). Replace with correct table at end of Errata Section.</p>   |
| 2-42                 | <p>Table 2-5. Comparative Impact Summary (Wildlife - ESA Conclusion). Listed Fish - replace with "may affect".</p>   |
| <b>CHAPTER THREE</b> |  |
| 3-4                  | <p>Section 3.2.2. Air Quality. Third paragraph, delete last two sentences. Identification of the nearest "nonattainment" area in the DEIS is incorrect. The trona industrial area is not in a "nonattainment" area. The concentration contours do not overlap. The impact of one well, defined by concentration contours, already takes into account the topography and the meteorology of the area.</p>   |
| 3-6                  | <p>Table 3-3. To column headed "National Primary Standard", change the PM<sub>10</sub> Annual from 5 to 50.</p>  |
| 3-7                  | <p>Section 3.4.1 Geology. Correction to last sentence of paragraph 2: "... subsurface geological deposits, is found in Table 3-5."</p>   |
| 3-8                  | <p>Section 3.4.2 Mineral Resources. Following paragraph 5, insert the following paragraphs:</p> <p>"The BLM documents violation of environmental laws and regulations under two categories - undesirable events and incidence of non-compliance. During the period of increased drilling activity, environmental violations that were documented are as follows:</p> <p>Undesirable Events - Nine undesirable events occurred within the Moxa Arch project area between January 1990 and September 1995. All nine events were minor. Two involved leaks in load pipe/separator which were contained on location; three involved reserve pit not fenced, netting disrepair, and hydrocarbon on water; two involved tinhorn leak of blow-down fluid onto ground on location; and two involved cleanup of spills around well head. No contamination of waters occurred within the Moxa Arch project area.</p> <p>Incidence of Non-Compliance - Fourteen incidence of non-compliance were documented between January 1990 and September 1995. Ten incidences involved operator failure to comply with well pad and access road construction or maintenance requirements, and four concerned operator failure to implement required reclamation."</p> |
| 3-8                  | <p>Section 3.4.3 Paleontology. Change paragraph 4, lines 1 and 2 to read: "The Quaternary deposits are probably, for the most part, world-renowned. The Bridger Formation and ..."</p>   |
| 3-9                  | <p>Exhibit 3-2. Geologic Map of the Moxa Analysis Area. This Exhibit has been corrected. See corrected exhibit at end of the Errata section.</p>   |



## ADDENDUM AND ERRATA

| Page | Errata  |
|------|---|
| 3-12 | Section 3.4.3 Paleontology. Partial paragraph at top left, change second line to read: "... Green River Formation having paleontologic potential ..." Add to end of paragraph: "Information on the location of areas of high paleontologic potential are shown on FEIS Exhibit 2-1." Exhibit 2-1 is a new addition to the DEIS and is found at the end of the Errata section in this FEIS.  |
| 3-12 | Section 3.4.3 Paleontology. First paragraph at top left, change first line to read: "... Technical analysis of paleontologic inventory ..." Change last line to read: "... provided in Appendix D, Tables D-1 and D-2."   |
| 3-28 | Section 3.7 Fisheries. Add the following species to 2nd paragraph:<br>Lines 1 - 9: "Game fish in the Hams Fork include brown trout ( <i>Salmo trutta</i> ), rainbow trout ( <i>Oncorhynchus mykiss</i> ), channel catfish ( <i>Ictalurus punctatus</i> ), and mountain whitefish ( <i>Prosopium williamsoni</i> ) and, in the Blacks Fork, the channel catfish. The Green River/Fontenelle Reservoir game fish include rainbow, brown, lake ( <i>Salvelinus namaycush</i> ) and cutthroat ( <i>Oncorhynchus clarki</i> ) trout, kokanee ( <i>Oncorhynchus nerka</i> ), mountain whitefish, while smallmouth bass ( <i>Micropterus dolomieu</i> ) occurs in the downstream reaches of the Green River and Flaming Gorge Reservoir. ..."<br>Lines 15 - 16: Delete "red shiner ( <i>Notropis lutrensis</i> ), ..."   |
| 3-30 | Table 3-10 Noxious and Undesirable Weeds for the Moxa Analysis Area. Correct table by adding Halogeton and Russian thistle.   |
| 3-33 | Section 3.9.1 Wildlife Habitat. Paragraph 2, line 4, correct plan title as follows: "... through the development of a <i>Moxa Arch Pronghorn Habitat and Livestock Forage Loss Mitigation Plan</i> . This plan ..."   |
| 3-35 | Section 3.9.3 Big Game - <u>Pronghorn Antelope</u> . First paragraph, left column, is modified (indicated by shading) as follows to reflect 1994 data presented in updated Table 3-14 (see updated Table at end of Errata Section): "Pronghorn antelope use the analysis area year-round. <del>Post-season</del> population estimates for the three herd units range from <del>2</del> to <del>34</del> percent below objective. Baseline data did not afford a population estimate for the analysis area; however, <del>1994</del> data from the WGFD indicate a mean density of <del>3.4</del> antelope per square mile (Table 3-14). Antelope production in the analysis area ranges from <del>44-86</del> fawns per 100 does and has <del>increased</del> by as much as <del>34</del> percent from the four-year per-season average fawn crop from 1990-1993. This has been attributed to the <del>relatively mild</del> winter conditions of 1993-94, combined with the <del>increase</del> in <del>precipitation</del> throughout the region during the spring of 1994 (WGFD 1995a)." |
| 3-36 | Table 3-14. Population Parameters for Big Game Herd Units within the Moxa Arch Analysis Area. This Table has been updated to reflect 1994 population statistics and appropriate supplementation of impact analysis text made. The updated Table 3-14 is presented at the end of the Errata Section.   |



ADDENDUM AND ERRATA

| Page | Errata   |
|------|--|
| 3-39 | <p>Section 3.9.3 Big Game - <u>Mule Deer</u>. Second paragraph, left column, is modified (indicated by shading) as follows to reflect 1994 data presented in updated Table 3-14 (see updated Table at end of Errata Section): "Post-season population estimates range from <del>44</del> to <del>41</del> percent below the objectives for the Wyoming Range and Steamboat herd units, respectively, to <del>114</del> percent above objective for the Uinta herd unit. No baseline population estimates are available for mule deer in the analysis area; however, <del>1994</del> data from the WGFD indicate a mean density of <del>3.8</del> mule deer per square mile (Table 3-14). Mule deer production in the analysis area ranges from <del>61-76</del> fawns per 100 does and has, between <del>1990 and 1993</del>, increased by as much as <del>21</del> percent for the four-year average. As with pronghorn, this increase has been attributed to the <del>increased precipitation and mild weather conditions (WGFD 1995a).</del>"</p>   |
| 3-39 | <p>Section 3.9.3 Big Game - <u>Elk</u>. First paragraph, lines 9 - 10, are corrected as follows: "... Severe Winter Relief, occupies <del>56.6</del> square miles or <del>7.6</del> percent of the analysis area ..."</p> <p>Second paragraph is modified (indicated by shading) as follows to reflect 1994 data presented in updated Table 3-14 (see updated Table at end of Errata Section):<br/>           "The <del>1994</del> post-season population estimate for the West Green River herd unit was <del>4,070</del> elk, which is <del>24</del> percent above the objective of 3,100 animals. The density estimate for elk in this unit is <del>0.94</del> animals per square mile of occupied habitat. Elk production in the area averaged <del>50</del> calves per 100 cows in <del>1994</del>, which is near the four year post-season average (<del>1990-1993</del>) of 47.5 calves per 100 cows (WGFD <del>1995a</del>). This herd unit is the only elk herd in the Bridger-Teton National Forest that does not have permanent feed grounds to sustain the wintering populations."</p> |
| 3-39 | <p>Section 3.9.3 Big Game - <u>Moose</u>. Third paragraph is modified (indicated by shading) as follows to reflect 1994 data presented in updated Table 3-14 (see updated Table at end of Errata Section):<br/>           "The Lincoln moose herd unit had a <del>1994</del> post-season population estimate of <del>1,177</del> moose, which is <del>22</del> percent below the objective of 1,500 animals. The density estimate for moose in this unit is <del>0.33</del> animals per square mile of occupied habitat. In <del>1994</del>, moose production in the area averaged <del>54</del> calves per 100 cows, which is <del>22</del> percent higher than the <del>four</del> year post-season average calf crop between <del>1990-1993</del>."</p>   |
| 3-68 | <p>Left column, first full paragraph, should have the following Section heading above it: "3.10.3.1 Candidate Fish Species."</p>   |
| 3-68 | <p><u>Flannelmouth Sucker</u>. Third paragraph is corrected to read as follows: "At least nine occurrences of the flannelmouth sucker have been reported by the WYNDD for the project area. Viable populations of flannelmouth suckers are known to occur in the Green River, Blacks Fork River, and the Hams Fork River. This species is common in the stretch of the Green River between Flaming Gorge Reservoir and Fontenelle Dam."</p>  |
| 3-68 | <p><u>Roundtail Chub</u>. To the end of the first paragraph, add the following sentence: "... However, viable populations of the roundtail chub are known to occur in the Green, Blacks Fork, and Hams Fork Rivers. Although this species is not as common in the Green river, records of its reproduction there have been documented recently (1990)."</p>  |



**ADDENDUM AND ERRATA**

| Page                | Errata  |
|---------------------|---|
| 3-68                | <p><u>Leatherside Chub</u>. Add this heading and the following paragraph following the roundtail chub discussion: "<u>Leatherside Chub</u>. The leatherside chub is rare in Wyoming, but occurs within the Green River, Snake River, and Bear River watersheds in Wyoming (Baxter and Stone 1995) where it frequents the pools of clear, cool streams. Within the Green River drainage it is known to occur in the North Fork of Slate Creek in Lincoln County. According to Baxter and Stone (1995) hybrids of this species and speckled dace and redbreast shiners are common when these species cohabit the same waters."</p>  |
| 3-79                | <p>Section 3.15.2, 3rd paragraph, 4th sentence is modified to read: "Thus, 2,871 prehistoric sites/components and 237 historic sites/components have been recorded in the analysis area."</p>   |
| 3-81                | <p>Section 3.15.2.1. Rock Art. Delete last sentence.</p>  |
| 3-83                | <p>Exhibit 3-21 Historic Trails within the Moxa Analysis Area. This Exhibit has been corrected. See corrected exhibit at end of the Errata section.</p>   |
| <b>Chapter Four</b> |   |
| 4-15                | <p><u>Paleontology</u>. Add under heading the following sentence: "The Kemmerer Resource Management Plan identifies the following requirements for the management of the paleontological resource:"</p> <p>Second bullet, add following corrections: "... Operations causing disturbance in areas of high paleontologic potential will require a paleontological survey by a qualified paleontologist as determined by the AO, and mitigating measures will ... known paleontological sites. See FEIS Exhibit 2-1 for areas of high paleontologic potential."</p>   |
| 4-17                | <p>Section 4.4.6.3 Paleontology. Paragraph 1, line 3 is changed to read: "... fossil resources identified by technical analysis of existing data must be addressed and ..."</p> <p>Paragraph 2, line 4 is changed to read: "... project basis within high potential areas (FEIS Exhibit 2-1). Mitigation measures ..."</p>  |
| 4-18                | <p>Section 4.4.6.3 Paleontology - <u>Specific Measures</u>. Change line 2 and 3 in paragraph to read as follows: "... in areas of high paleontologic sensitivity ..."</p> <p><u>Class III Field Survey</u>. Change portions of paragraph to read as follows: "<u>Field Survey</u>. Prior to construction disturbance, areas of high paleontologic potential identified during the technical analysis of existing data will be ... of fossil resources. The field survey can be ... following the completion of the field survey."</p> <p><u>Mitigation Planning</u>. Change paragraph 3, line 2 to read as follows: "... during or following any field survey ..."</p> <p><u>Submission of a Final Technical Document</u>. Change paragraph 1, line 5 to read as follows: "... completion of field surveys and the ..."</p> |
| 4-20                | <p>Section 4.5.3.1 Proposed Action. Change 1st sentence in paragraph 4 to read: "Because sensitive soils (see Exhibit 3-4) are distributed throughout the analysis area, total avoidance of sensitive soils <u>may not</u> be possible".</p>  |



**ADDENDUM AND ERRATA**

| Page | Errata   |
|------|--|
| 4-35 | <p>Section 4.6.6 Mitigation Summary (Water Resources). Add the following to this section: "A water resources and groundwater monitoring program could be developed to ensure contamination of usable aquifers does not occur. This should be conducted in cooperation with Wyoming Oil and Gas Conservation Commission, Wyoming State Engineer, Wyoming Department of Environmental Quality, and the Moxa Arch Operators. In conjunction with the development of a water resources monitoring program, the Wyoming Department of Environmental Quality 303(d) list and 305(b) report should be referenced to insure water quality impaired or threatened stream segments, pollutants of concern, and pollutant sources are identified in the planning to assure compliance with the Clean Water Act during site-specific project implementation."</p>  |
| 4-48 | <p>Top left column, line 1, correct plan title as follows: "... <i>Moxa Arch Pronghorn Habitat and Livestock Forage Loss Mitigation Plan</i> ..." Make same correction top right paragraph, lines 5 - 6.</p>   |
| 4-51 | <p>Section 4.9.3.1.2 Big Game. <u>Pronghorn Antelope</u>. Left column, last paragraph under Pronghorn The statement in the DEIS (4.13) is incorrect. It should read, "An increase in drilling and production facilities could also cause a safety hazard to those oil field workers who work in the traditional hunting areas during the hunting season."</p>  |
| 4-66 | <p>Section 4.9.6.3 Raptors. Add the following:</p> <p>"Raptors should be afforded protection as follows:</p> <ul style="list-style-type: none"> <li>• Well locations, pipelines, and associated roads should be selected and designed to avoid disturbances to areas of high wildlife value (e.g., raptor nest sites, wetland areas). In conjunction with the <i>Moxa Arch Pronghorn Habitat and Livestock Forage Loss Mitigation Plan</i>, operators should include the design of a raptor mitigation program for the Moxa Arch project area in consultation with the BLM, FWS, and WGFD.</li> <li>• Raptor nest surveys should be conducted within a 1-mile radius or linear distance of proposed surface uses or activities if such activities are proposed to be conducted between February 1 and July 31;</li> <li>• All surface disturbing activity (e.g., road, pipeline, well pad construction; drilling, completion, workover operations;) should be seasonally restricted from February 1 through July 31 within a one-half (1/2) mile radius or linear distance of all active raptor nests, except ferruginous hawk nests for which the seasonal buffer should be one (1) mile. (An active raptor nest is defined as a nest that has been occupied within the past 3 years.) The seasonal buffer distance and exclusion dates applicable may vary depending upon such factors as the activity status of the nest, species involved, prey availability, natural topographic barriers, and line-of-sight distance(s);</li> <li>• Permanent and high profile structures such as well pads, roads, buildings, storage tanks, overhead powerlines, etc., should not be allowed within 825 feet (0.25 km) of active raptor nests, with the exception of active eagle nests for which the distance should be 1,970 feet (0.60 km). The buffer distance may vary depending upon the species involved, prey availability, natural topographic barriers, and line-of-sight distances. Linear disturbances such as pipelines, seismic activity, etc., could be granted exceptions."</li> </ul> |



**ADDENDUM AND ERRATA**

| Page                            | Errata  |                                 |                                |                           |   |                          |   |                           |   |
|---------------------------------|---|---------------------------------|--------------------------------|---------------------------|---|--------------------------|---|---------------------------|---|
| 4-77                            | <p>Section 4.10.4 Cumulative Impacts. <u>Special Status Plants</u>. Revise second paragraph, lines 10 - 12, as follows: "... given the propensity of the analysis area to contain special status plants and the lack of <u>site-specific</u> comprehensive surveys <u>at project facility locations in the field</u> to identify species and habitat".</p>  |                                 |                                |                           |   |                          |   |                           |   |
| 4-78                            | <p>Section 4.10.4, Cumulative Impacts, <u>Special Status Animals</u> - <u>Mountain Plover</u>. Add the following to the end of this subsection:</p> <p>"If deemed appropriate, Mountain Plover surveys should be made in accordance with FWS guidelines provided in their Fontenelle DEIS comment letter of June 29, 1995. The survey procedures should include the following:</p> <ul style="list-style-type: none"> <li>• Visual observation of the area within 1/4 mile of the proposed action and 100 yards of proposed access routes should be made to detect the presence of plovers. All plovers located should be observed long enough to determine if a nest is present.</li> <li>• Surveys should be conducted no more than 14 days prior to the date actual ground disturbance activities begin. If two surveys are required, they should be made at least 14 days apart, with the last survey no more than 14 days prior to the start-up date.</li> <li>• The number of surveys required to clear a site for mountain plovers prior to beginning a planned activity is dependent upon the start-up date, as shown below:</li> </ul> <table border="0"> <thead> <tr> <th align="center"><u>Date of planned Activity</u></th> <th align="center"><u>Number Surveys Required</u></th> </tr> </thead> <tbody> <tr> <td align="center">March 15 through April 15</td> <td align="center">1</td> </tr> <tr> <td align="center">April 15 through July 15</td> <td align="center">2</td> </tr> <tr> <td align="center">July 15 through August 15</td> <td align="center">1</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>• If an active nest is found in the survey area, the planned activity should be delayed at least 30 days. If a brood is observed, activities should be delayed at least seven days." </li></ul> | <u>Date of planned Activity</u> | <u>Number Surveys Required</u> | March 15 through April 15 | 1 | April 15 through July 15 | 2 | July 15 through August 15 | 1 |
| <u>Date of planned Activity</u> | <u>Number Surveys Required</u>  |                                 |                                |                           |   |                          |   |                           |   |
| March 15 through April 15       | 1   |                                 |                                |                           |   |                          |   |                           |   |
| April 15 through July 15        | 2   |                                 |                                |                           |   |                          |   |                           |   |
| July 15 through August 15       | 1   |                                 |                                |                           |   |                          |   |                           |   |
| 4-80                            | <p>Section 4.10.2.1 Proposed Action - <u>Special Status Animals</u> - <u>Black-Footed Ferret</u>. Add the following to the end of this section:</p> <p>"Surface disturbing activity that will involve prairie dog burrows would require black-footed ferret surveys in accordance with FWS 1989 Black-footed Ferret Survey Guidelines. To ensure maintaining the size and distribution of the prairie dog complex in the Moxa Arch area, the following actions could be implemented during the development of the field:</p> <p>(Continued on following page)</p>   |                                 |                                |                           |   |                          |   |                           |   |



ADDENDUM AND ERRATA

| Page          | Errata   |
|---------------|--|
| 4-80<br>Cont. | <p>Section 4.10.2.1 Proposed Action - <u>Special Status Animals</u> - <u>Black-Footed Ferret</u> (continued).</p> <ul style="list-style-type: none"><li>• Site Access and Preparation<ul style="list-style-type: none"><li>- Align roads to avoid significant effects to prairie dog colonies and sensitive vegetation.</li><li>- Install adequate devices to maintain natural waterways and prevent erosion. Changes in water flow regimes can cause unnecessary flooding of prairie dog burrow systems.</li><li>- Incorporate present and future land uses in the design and alignment to minimize total habitat loss and repeated disturbances.</li><li>- Use the minimum width roadway necessary to meet short and long-term land use plans.</li><li>- If roads cannot avoid prairie dog colonies, design and lay-out access roads that cross prairie dog colonies through: (1) the lowest prairie dog density areas (&lt; eight burrows per acre), (2) the edges of prairie dog colonies, and (3) the shortest transect of the colony as possible.</li></ul></li><li>• Well site Construction<ul style="list-style-type: none"><li>- Avoid locating well sites in prairie dog colonies or use directional drilling techniques.</li><li>- Minimize area affected by containing equipment and activities within the well sites and rights-of-way.</li><li>- Well sites in prairie dog colonies should be located in low density prairie dog areas (&lt; eight burrows per acre).</li></ul></li><li>• Long-term Production<ul style="list-style-type: none"><li>- Establish treatment and storage facilities off prairie dog colonies.</li><li>- Oil residue and other contaminants from mud pits may be hazardous to wildlife. Remove hazardous materials to an approved off site facility before filling and reclaiming pits.</li><li>- Mitigate significant habitat disturbances and loss occurring on colonies.</li></ul></li><li>• Placement of Centralized Production Facility<ul style="list-style-type: none"><li>- These facilities should be located off prairie dog colonies.</li></ul></li></ul> <p>(Continued on following page)</p> |



**ADDENDUM AND ERRATA**

| Page          | Errata  |
|---------------|---|
| 4-80<br>Cont. | <p>Section 4.10.2.1 Proposed Action - <u>Special Status Animals</u> - <u>Black-Footed Ferret</u> (continued).</p> <ul style="list-style-type: none"> <li>• Pipeline Installation <ul style="list-style-type: none"> <li>- Avoid placing pipelines through prairie dog colonies.</li> <li>- Where avoidance is not possible, pipelines should be routed through prairie dog colonies less than 30 acres and with prairie dog burrow densities less than eight burrows per acre.</li> <li>- In larger colonies, pipelines should transect the colony at its narrowest point and near the colony edge to minimize disturbances within the colony.</li> <li>- Topsoil salvage and the double-ditching technique should be considered whenever burying large pipes. While this may disturb more surface, more rapid reclamation of vegetation should also occur. To minimize disturbance for smaller pipes, options such as the use of direct burying, pulling pipe, and other methods should be explored.</li> <li>- Prevent waste water discharges in or near prairie dog colonies, unless appropriate State and Federal water quality standards are met. Even then the quantity of discharge should not result in burrow inundation.</li> </ul> </li> <li>• Spills and Cleanup <ul style="list-style-type: none"> <li>- Low-impact cleanup techniques should be used for spills within 1/8 miles of a prairie dog colony. Carefully consider the effects of dispersants, emulsifiers, and other chemical agents on prairie dogs and vegetation in the cleanup strategic plan.</li> <li>- Spills not on prairie dog colonies should be contained to avoid contamination of nearby prairie dog colonies.</li> </ul> </li> <li>• Abandonment <ul style="list-style-type: none"> <li>- Due to the fossorial (burrowing) activities of prairie dogs, burial of drilling mud and other wastes must be carefully engineered, monitored and coordinated. Waste removal from prairie dog colonies is recommended to avoid future significant impacts.</li> <li>- Habitat enhancements may be recommended in some areas to encourage prairie dogs.</li> <li>- Removal of concrete or other impervious surfaces and equipment is beneficial and recommended.</li> <li>- Dry hole markers greater than 12 inches above ground level should be avoided or made inaccessible for raptor perching. Retrofitting existing dry hole markers to discourage raptor perching is also recommended."</li> </ul> </li> </ul> |



**ADDENDUM AND ERRATA**

| Page                    | Errata  |
|-------------------------|---|
| 4-83                    | Section 4.11.6 Mitigation Summary. First bullet, change lines 1 - 4 to read as follows: "In VRM Class II areas along Fontenelle Reservoir, the Green River, along the west boundary of Seedskaadee NWR, and Hams Fork River prohibit drilling locations, or use directional or horizontal drilling techniques from outside VRM Class II area. Restrict drilling locations, where ..."   |
| <b>References Cited</b> |   |
| R-9                     | Add: O'Gara, B.W. and Yoakum, J.D., eds. 1992. Pronghorn management Guides. Pronghorn Antelope Workshop, Rock Springs, Wyoming, 101pp.  |
| R-14                    | Add: U.S. Department of the Interior, Bureau of Land Management. (USDI-BLM). 1995. Fontenelle natural gas infill drilling projects draft environmental impact statement. USDI-Bureau of Land Management, Rock Springs District/Green River Resource Area. April, 1995.  |
| R-16                    | Add or revise the WGFD citations as follows:<br>Delete: _____. 1993a. Annual big game herd unit reports. No. 4. 423pp.<br>Revise: _____. <del>1993b. 1993</del> Annual report upland game and furbearer harvest 1992. 85pp.<br>Add: _____. 1995a. Annual big game herd unit reports. No.4.  |
| <b>Appendix A</b>       |   |
| A-6                     | Appendix A - Bureau of Reclamation Stipulations for Surface Use (Oil and Gas Drill Sites and Access Roads). Add stipulation number 16: Any drilling activity on public lands administered by the BOR will be subject to BOR requirements including no directional drilling under Fontenelle Dam.  |
| <b>Appendix B</b>       |   |
| B-2                     | Appendix B - Reclamation Guidelines. Add to end of 3rd full paragraph: "Temporary reclamation measures may also include consideration of the possibility of using a standing crop of sterile annual plants."  |
| B-13<br>to<br>B-20      | Appendix B - Reclamation Guidelines. Replace seed mix on the listed pages with the following:<br><br>"The following revised seed mixture is the result of an extensive assessment of successful reseeding efforts within the Moxa Arch area. The assessment is the result of the combined coordination efforts of BLM botanist, University of Wyoming FWS Cooperative Research Unit, industry, and landowners."<br><br>Replace old seed mix tables with new seed mix tables at the end of the Errata section. |
| <b>Appendix C</b>       |   |
| C-3                     | Appendix C - Hazardous Substances Management Plan. The wording in paragraph 1, the 1st sentence, page C-3 is changed to read: "Condensates would be stored in tanks at well locations and centralized facilities, and all tanks will be fenced and surrounded by an impervious dike of sufficient size to hold the entire storage capacity of the largest tank in the battery and still allow one foot of freeboard. Condensates will be periodically removed ..."  |



**ADDENDUM AND ERRATA**

| Page              | Errata   |
|-------------------|--|
| <b>Appendix D</b> |  |
| D-2               | <p>Section D.2.1 Applicable Laws, Regulations, and Policies. Correct paragraph 2, line 1: "... agencies now require a technical analysis of existing data (Literature and Records) by a qualified paleontologist ..."</p> <p>Paragraph 1, line 5: "... methods. A technical analysis of existing data may result in the ..."</p> <p>Paragraph 2, line 2: "... in areas identified by the technical analysis of existing data as having high ..."</p> |
| D-3               | <p>Section D.2.2 <u>Paleontologic Potential</u>. Correct line 3: "... determined by a technical analysis of existing data."</p> <p>Line 5: "... produce significant fossils based of a field survey. Usually an ..."</p> <p>Section D.2.3. Change title to: "Geologic Deposits with Paleontologic Potential".<br/>Change lines 1 and 2 in paragraph under D.2.3.1 to read: "... Quaternary deposits are thought to be old ..."</p>                   |
| D-6               | <p>Section D.2.3.3. Green River Formation. Change line 1 in 4th paragraph to read: "Fossil vertebrates known from locality G-1 are listed in Tables D1 and 2. In addition ..."</p>   |



**ADDENDUM AND ERRATA**

**Table 2-5. Comparative Impact Summary (Air Quality)**

|  | <b>PROPOSED ACTION</b>     | <b>Alternative A</b>       | <b>Alternative B-No Action</b> |
|--|----------------------------|----------------------------|--------------------------------|
| Air Quality  | Potential SI               | Potential SI               | NSI                            |
| Compliance w/RMP                                       | YES                        | YES                        | YES                            |
| Compliance with WAAQS and NAAQS                        | YES                        | YES                        | YES                            |
| Potential Maximum impacts ( $\mu\text{g}/\text{m}^3$ ) | (Includes Background)      | Lower than Proposed Action | (background)                   |
| CO 8-hour  | 1560.0                     |                            | 1500 + UAD                     |
| CO 1-hour  | 3595.0                     |                            | 3500 + UAD                     |
| NO <sub>2</sub> Annual                                 | 15.7                       |                            | 10 + UAD                       |
| Ozone 1-hour   | 149.0                      |                            | 129 + UAD                      |
| PM <sub>10</sub> Annual                                | 14.8                       |                            | 13 + UAD                       |
| PM <sub>10</sub> 24-hour                               | 68.7                       |                            | 45 + UAD                       |
| TSP 24-hour  | 110.9                      |                            | 45 + UAD                       |
| SO <sub>2</sub> Annual                                 | 11.3                       |                            | 9 + UAD                        |
| SO <sub>2</sub> 24-hour                                | 60.1                       |                            | 43 + UAD                       |
| SO <sub>2</sub> 3-hour                                 | 183.3                      |                            | 132 + UAD                      |
| Visibility Reduction                                   | 0 - 26 days<br>>1 deciview | Lower than Proposed Action | NSI                            |



ADDENDUM AND ERRATA

Table 3-14. Population Parameters for Big Game Herd Units within the Moxa Arch Analysis Area. (Shading indicates changes to DEIS Table 3-14.)

| Species   | Herd Unit   | Herd Unit Number | Hunt Areas                    | Size (Sq. miles) | Population Estimate (1994) | Population Objective (1994) | Density Estimate <sup>1</sup> (1994) | % Contained within MOXA | Fawn:Doe Ratio (1994) |
|-----------|---|------------------|-------------------------------|------------------|----------------------------|-----------------------------|--------------------------------------|-------------------------|-----------------------|
| Antelope  | West Green River<br>Carter Lease<br>Uinta-Cedar<br>Mountain | 417              | 93                            | 1,590            | 7,810                      | 8,000                       | 4.91                                 | 23.90                   | 86:100 <sup>2</sup>   |
|           |   | 419              | 94, 98, 100                   | 2,649            | 3,975                      | 6,000                       | 1.50                                 | 10.00                   | 79:100 <sup>2</sup>   |
|           |   | 411              | 95, 99                        | 2,264            | 8,245                      | 10,000                      | 3.64                                 | 05.10                   | 44:100 <sup>2</sup>   |
| Mule Deer | Steamboat<br>Wyoming Range<br>Uinta                         | 430              | 99, 131                       | 4,071            | 2,354                      | 4,000                       | 0.58                                 | 00.20                   | 72:100 <sup>3</sup>   |
|           |   | 131              | 134, 135-137,<br>143-145, 147 | 5,588            | 28,232                     | 50,000                      | 5.05                                 | 11.40                   | 61:101 <sup>3</sup>   |
|           |   | 423              | 132, 133, 168                 | 2,649            | 15,000                     | 7,000                       | 5.66                                 | 04.40                   | 76:100 <sup>3</sup>   |
| Elk       | West Green River<br>Uinta                                   | 428              | 102, 103, 105                 | 4,264            | 4,070                      | 3,100                       | 0.94                                 | 15.10                   | 50:100 <sup>3</sup>   |
|           |   | 423              | 106, 107                      | 2,221            | 6,742                      | 600                         | 3.04                                 | 05.20                   | No data               |
| Moose     | Lincoln<br>Uinta  | 417              | 26, 33, 40                    | 3,580            | 1,177                      | 1,500                       | 0.33                                 | 18.00                   | 54:100 <sup>3</sup>   |
|           |   | 415              | 27, 35                        | 2,162            | 900                        | 600                         | 0.42                                 | 05.40                   | No data               |

<sup>1</sup> = Number of Animals Per Square Mile of Occupied Habitat.

<sup>2</sup> = Prehunt Classification.

<sup>3</sup> = Posthunt Classification.



ADDENDUM AND ERRATA

Appendix B - Moxa Area Seed Mixes

Recommended Moxa Arch Seed Mixes

UPLANDS

| <u>SPECIES</u>        | <u>Price/lb</u> | <u>lbs/ac</u> | <u>COST</u>      |
|-----------------------|-----------------|---------------|------------------|
| Western wheatgrass    | 3.50            | 6             | 21.00            |
| Thickspike wheatgrass | 6.50            | 6             | 39.00            |
| Indian ricegrass      | 4.25            | 3             | 12.75            |
| Shadscale saltbush    | 9.00            | 3             | 27.00            |
| Globemallow           | 32.00           | <u>0.5</u>    | <u>16.00</u>     |
|                       |                 | Total = 18.5  | Total = \$115.75 |

substitutions for globemallow: western yarrow and/or blue flax

SALINE LOWLANDS

| <u>SPECIES</u>           | <u>Price/lb</u> | <u>lbs/ac</u> | <u>COST</u>      |
|--------------------------|-----------------|---------------|------------------|
| Western wheatgrass       | 3.50            | 6             | 21.00            |
| Bottlebrush squirreltail | 18.50           | 3             | 55.50            |
| Gardner saltbush         | 18.00           | 2             | 36.00            |
| Basin wildrye            | 5.50            | <u>4</u>      | <u>22.00</u>     |
|                          |                 | Total = 15    | Total = \$134.50 |

substitutions: Sandberg bluegrass

WET MEADOW/MARSH

| <u>SPECIES</u>   | <u>Price/lb</u> | <u>lbs/ac</u> | <u>COST</u>      |
|------------------|-----------------|---------------|------------------|
| Alkali sacaton   | 14.00           | 3             | 42.00            |
| Nebraska sedge   | 40.00           | 1             | 40.00            |
| Tufted hairgrass | 18.00           | 2             | 36.00            |
| Alkaligrass      | 4.00            | <u>4</u>      | <u>16.00</u>     |
|                  |                 | Total = 10    | Total = \$134.00 |

Replace silver buffaloberry shrubs along Black's Fork.



ADDENDUM AND ERRATA

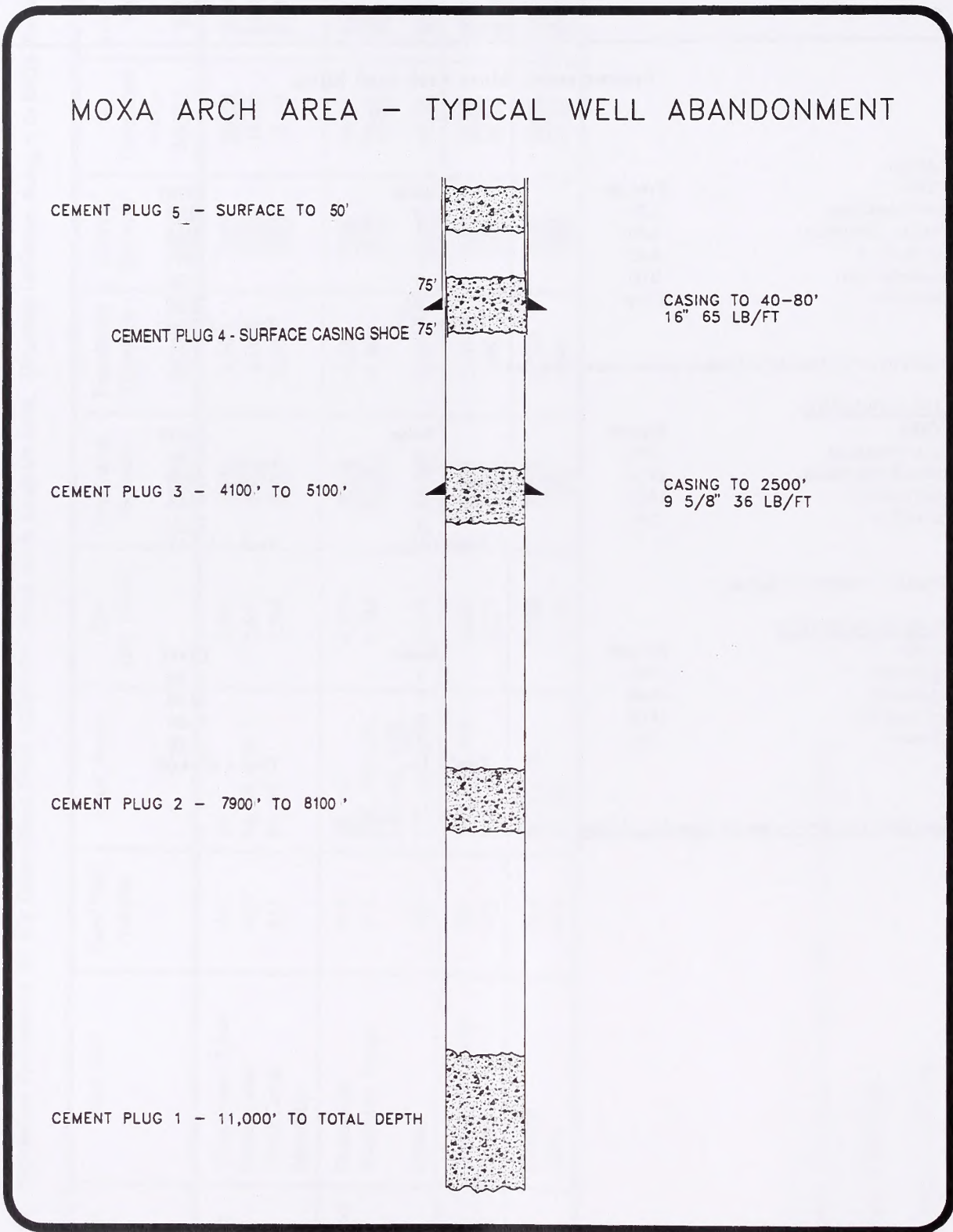
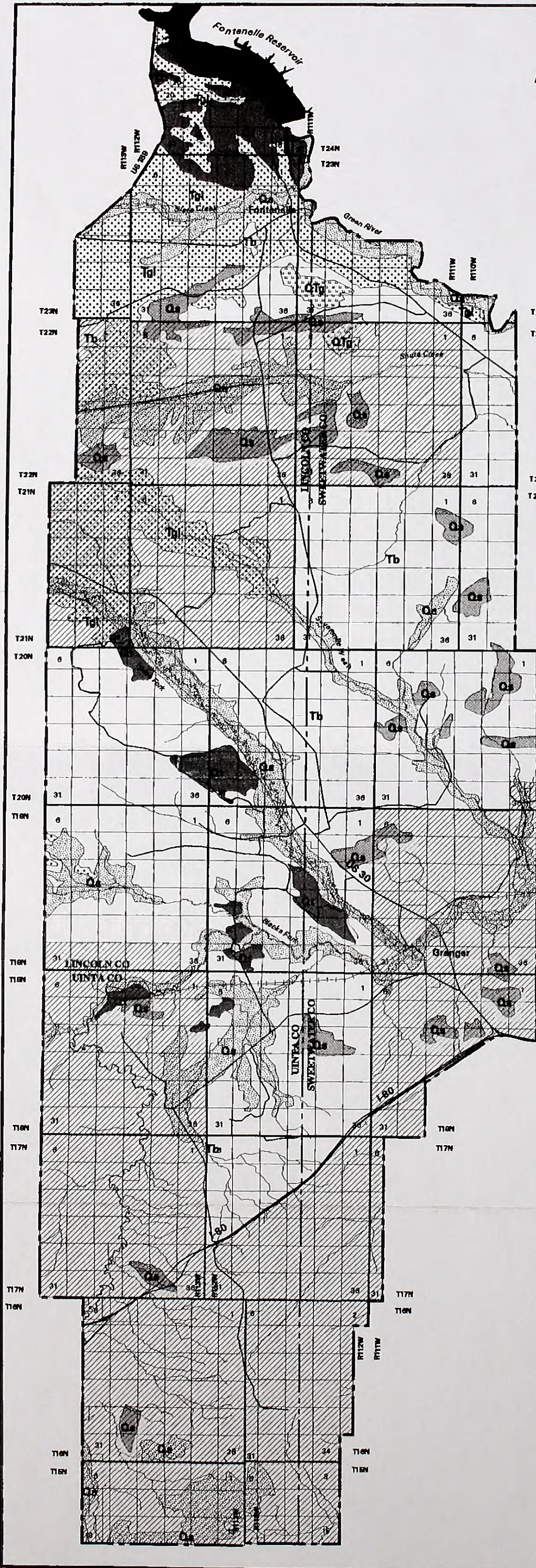
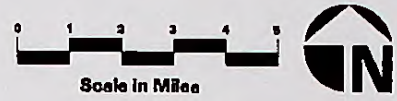


Exhibit 2-13. Typical Abandoned Wellbore Diagram.



# Moxa Arch E.I.S.



## Symbol Legend:

### Surficial Geologic Units:

- QTg - Quaternary Terrace Gravel
- Qa - Quaternary Alluvium and Colluvium
- Qs - Quaternary Dune Sand and Loess
- Qt - Quaternary Gravel, Pediments, and Fen Deposits
- Tb - Tertiary Bridger Formation
- Tgl - Tertiary Green River Formation - Laney Member

### Paleontologic Remains Potential:

- High Potential Areas

#### Note:

- Remainder of Moxa Arch Area is Low Potential.
- Construction activities on Federal lands in High Potential Areas will require paleontologic field surveys, except where Quaternary Surficial Geologic Units occur.
- In Low Potential Areas a field survey will generally not be required.

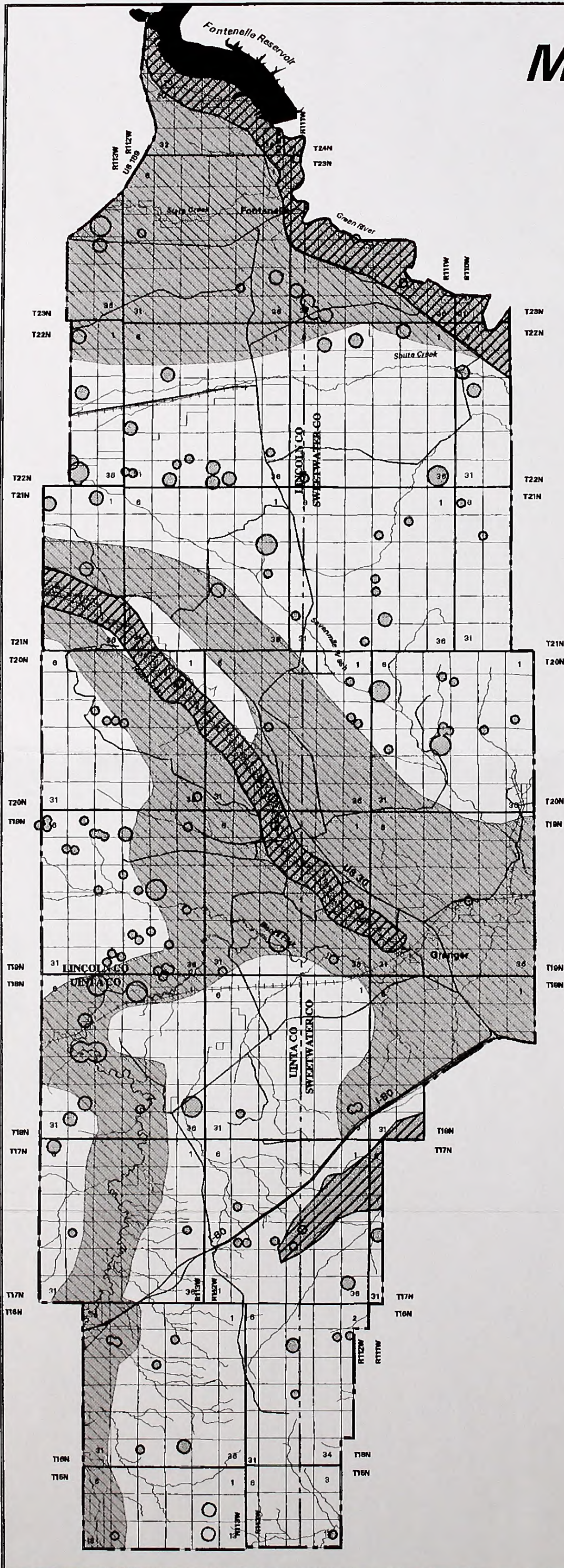
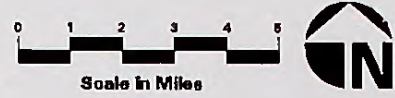
Exhibit 2-1. Areas of High Potential for Encountering Paleontologic Remains within the Moxa Analysis Area.







# Moxa Arch E.I.S.




## Symbol Legend:

 **Proposed Sensitive Areas Subject to Drilling Restriction.**

### NOTE:

*Includes wildlife crucial winter range for elk and antelope; sage grouse leks; raptor nesting concentration areas and VRM Class II areas.*

 **Sage Grouse Lek**

 **Raptor nesting concentration area**

 **VRM Class II area**

 **Big game crucial winter range**

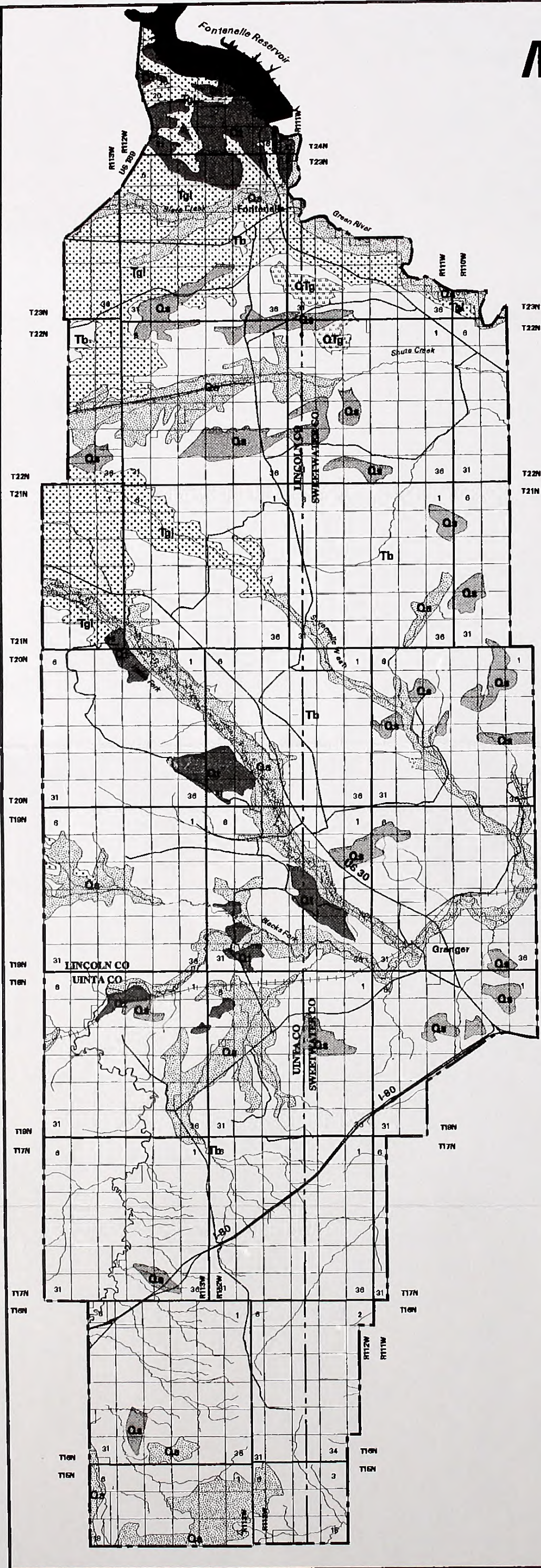
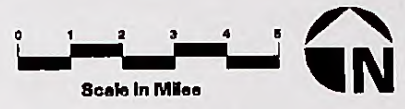
Exhibit 2-2. Sensitive Resource Areas Within the Moxa Analysis Area Subject to Drilling Restrictions.







# Moxa Arch E.I.S.



## Symbol Legend:

### Surficial Geologic Units:

- QTG - Quaternary Terrace Gravel
- Qa - Quaternary Alluvium and Colluvium
- Qs - Quaternary Dune Sand and Loess
- Qt - Quaternary Gravel, Pediments, and Fan Deposits
- Tb - Tertiary Bridger Formation
- Tgl - Tertiary Green River Formation - Laney Member

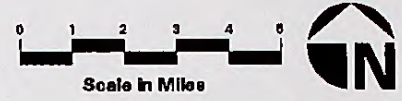
Exhibit 3-2. Surficial Geologic Unit Map of the Moxa Analysis Area.







# Moxa Arch E.I.S.



## Historic Trails

### Symbol Legend:

- Slate Creek Trail
- Pony Express/Oregon/Mormon/California
- Oregon Trail
- Hams Fork Cutoff
- Blacks Fork Cutoff

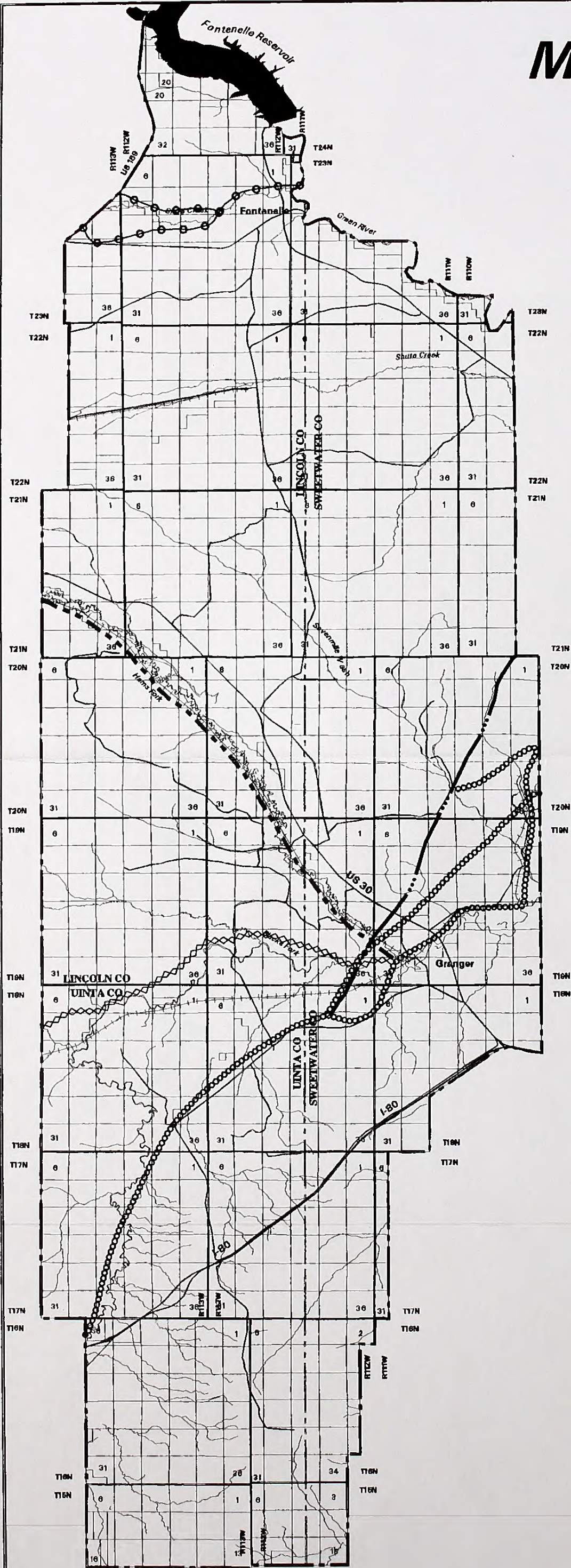


Exhibit 3-21. Historic Trails Within the Moxa Analysis Area.







Faint, illegible text in the left column, likely bleed-through from the reverse side of the page.

Faint, illegible text in the right column, likely bleed-through from the reverse side of the page.

**SECTION 3:  
CONSULTATION AND COORDINATION**

Faint, illegible text in the left column, likely bleed-through from the reverse side of the page.

Faint, illegible text in the right column, likely bleed-through from the reverse side of the page.

Faint, illegible text in the left column, likely bleed-through from the reverse side of the page.

Faint, illegible text in the right column, likely bleed-through from the reverse side of the page.







## SECTION 3 - CONSULTATION AND COORDINATION

### 3.1 SCOPING PROCESS

On December 16, 1995, the BLM published in the Federal Register and mailed a scoping statement to the media, governmental agencies, environmental organizations, industry representatives, individuals, landowners and grazing permittees. The scoping statement explained the scope of the Moxa Arch Operator's Proposed Actions and requested comments concerning the level of analysis included in the DEIS. The public was given until May 19, 1995 to comment. All comments received were incorporated into the analysis of issues identified in the DEIS (page 1-14). Twenty-three comment letters were received.

### 3.2 DRAFT EIS CONSULTATION AND COORDINATION

The BLM consulted with the Bureau of Reclamation, a Cooperating Agency, on issues, impacts, and mitigation measures on Bureau of Reclamation administered lands. The BLM requested a list of Federally endangered, threatened, and proposed species that could occur in the cumulative impact study area from the U.S. Fish and Wildlife Service. In addition, information on State species of concern was obtained from the Wyoming Natural Diversity Data Base and the Wyoming Game and Fish Department Wildlife Observation System.

### 3.3 PUBLIC REVIEW OF DRAFT EIS

Over 300 copies of the draft EIS were made available to the public and interested agencies on April 21, 1995 for a 50-day public comment period. The date by which comments had to be received was June 12, 1995. The public was invited to provide written comments on the draft EIS and they were also encouraged to visit the local Bureau of Land Management (BLM) offices listed in the Dear Reviewer letter to talk with the managers about any concerns. BLM did not schedule a public hearing on the DEIS because of the lack of environmental concern regarding the proposed projects. However, the public and readers were informed that a public hearing(s) on the DEIS would be scheduled if the tear-out sheet provided in the draft EIS was returned. The tear-out sheet had to be received no later than May 19, 1995 to schedule a hearing.

Information on the hearing(s) would be published in state and local newspapers and other media sources, and directly mailed to the recipients of the DEIS to give the public sufficient notice. However, no tear-out sheets were received by the BLM.

### 3.4 DRAFT EIS COMMENTS

A total of 23 comment letters were received during the 50-day public comment period provided on the draft EIS. No request for a public hearing was received.

Responses to all public comments received on the draft EIS have been prepared. In several cases respondents submitted virtually identical comments. Rather than repeating a response, the reader may be referred to an earlier response. Reference to a previous response in no way reflects upon the value of the comment. Copies of all comment letters have been reprinted and are presented in *Section 4: Comment Letters Received on the Draft EIS*. Responses to all comments are contained in *Section 5: Response to Public Comments on the Draft EIS*. Comments are numbered sequentially within a letter and correspond to the numbered response.

Public issues of most concern were the lack of analysis of the cumulative effects of mineral development on the non-mineral resources of southwestern Wyoming, including wildlife and air quality; the need for a regional, cumulative EIS before any further development is authorized; land use changes causing industrialization of southwest Wyoming; and impacts to water quality.

Specific changes in the text of the draft EIS are found in *Section 2: Addendum and Errata* of this final EIS. Where a response to a comment indicates "see Errata", Section 2 of the final EIS should be consulted for the specific rewording or clarification of the text.

### 3.5 COMMON CONCERNS

Most of the respondents to the Moxa Arch DEIS were also respondents to the Fontenelle DEIS. Respondents comments to the two DEISs expressed the same or very similar common concerns about the proposed infill drilling projects. BLM has prepared



## CONSULTATION AND COORDINATION

---

responses to these common concerns as well as to specific concerns raised in individual letters.

*General Comment A. The cumulative impacts from the Moxa Arch infill drilling projects and numerous other proposed oil and gas activities in southwest Wyoming are not being adequately evaluated.*

The Moxa Arch EIS addresses the cumulative impacts of past, present, and reasonably foreseeable actions within the Moxa Arch development area. The respondent may disagree with the spatial scale of the analysis; however, Federal regulations and the courts give the agency latitude to determine the appropriate spatial scale of analysis. The area considered in the EIS is far beyond that which has been found to be directly or indirectly adversely affected by project activities. The scope of analysis is consistent with BLM guidelines for cumulative impact analysis for NEPA documents (BLM 1994). BLM believes it has chosen an appropriate spatial scale to analyze past, present and reasonably foreseeable development.

*General Comment B. The EIS did not consider a reasonable range of alternatives to the Proposed Action and the No Action Alternative was improperly dismissed.*

The EIS does examine an appropriate range of alternatives identified during scoping. BLM is only required to consider reasonable alternatives.

The No Action Alternative was not dismissed in the EIS. BLM defined the No Action Alternative (p. 2-39) and the impacts of implementing this alternative were analyzed for each potentially affected resource. See subsections labeled "No Action Alternative" presented in each resource discipline section of Chapter 4 in the DEIS.

*General Comment C. The EA does not adequately address impacts on protected wildlife species or other wildlife resources.*

Reviews of existing databases, on-site examination of affected lands and potential habitat conducted during on-sites for past wells, past environmental analyses and site surveys found no evidence that implementation of the Proposed Actions or project alternatives would reduce the number, reproduction or

distribution of any federally listed species, or would adversely affect the status of any candidate species. The U.S. Fish and Wildlife Service has concurred in this conclusion as discussed in past NEPA documents prepared for projects in the Moxa Arch area. The U.S. Fish & Wildlife Service has concurred in the finding that the proposed project is not likely to adversely affect the black-footed ferret, bald eagle, peregrine falcon, and whooping crane. Where potentially affected as a result of project modification or new information, BLM, in cooperation with the U.S. Fish & Wildlife Service, the Wyoming Game & Fish Department and the companies, would conduct additional surveys and adopt protective measures as needed to ensure continued protection of federally-listed species. BLM is consulting with, and will rely on the expertise of, the U.S. Fish & Wildlife Service regarding the adequacy of protection of threatened and endangered species and the adequacy of the biological assessment.

*General Comment D. The proposed development does not account for the region-wide impacts causing the area to be converted to a heavily industrialized landscape. A programmatic cumulative effects EIS should be prepared for southwest Wyoming.*

As discussed in the DEIS, proposed infill drilling would take advantage of existing roads as much as possible to minimize new disturbance that would otherwise be introduced by the construction of new access roads. Similarly, the impacts of surface disturbance would be reduced by sitting new well pads and facilities in the vicinity of existing road corridors. Existing roads are also used by a variety of non-industrial resource users (e.g., ranchers).

BLM policy (FLPMA) regarding multiple use management of the public lands differs from some respondents assumptions of what constitutes industrialization. The development projected to occur within southwest Wyoming would not convert the landscape to one viewed as heavily industrialized. In accordance with FLPMA (Sec. 103 (1)), the management of the public lands within the Moxa Arch projects area would occur in a manner that ensures that the principal and major uses of grazing, fish and wildlife habitat development and utilization, mineral exploration and development, transportation, outdoor recreation, and rights-of-way are not



## CONSULTATION AND COORDINATION

---

excluded, but rather would continue to co-exist with each other. FLPMA (Sec. 103(c)), in its definition of multiple-use, provides for "making the most judicious use of the land for some or all of these resources"; and "the use of some land for less than all of the resources".

The total area within southwest Wyoming presently developed for resource extraction (i.e., coal, uranium, trona, and oil and gas production) occupies about 12.3% of the public land surface. The proposed increase in development will not appreciably increase the level of area occupied by oil and gas development since most of the development will be infill development within existing fields and on producing leases. Also, the projections for oil and gas development are "maximum" or "worst case" development levels for environmental impact analysis purposes.

BLM agrees that review of the regional, cumulative effects of mineral development in southwest Wyoming is warranted. On February 8, 1995 BLM announced that it had begun the *Southwest Wyoming Resource Evaluation*. The 16.5 million acre area (nearly 25,780 square miles) encompassed by the regional evaluation includes the Moxa Arch project area. However, the agency also believes that it is inappropriate to conduct, as part of the Moxa Arch EIS which is intended to address the impacts associated with a specific set of infill drilling projects, such an extensive and detailed review of regional impacts.



...the ... of ...

...the ... of ...

...the ... of ...

...the ... of ...

...the ... of ...

...the ... of ...

...the ... of ...

...the ... of ...

...the ... of ...

...the ... of ...



4.1 INTRODUCTION

The following comment letters were received from the public and interested agencies during the comment period on the Draft EIS. The comments were received on the Draft EIS from the public and interested agencies during the comment period on the Draft EIS. The comments were received on the Draft EIS from the public and interested agencies during the comment period on the Draft EIS.

**SECTION 4:**

**COMMENT LETTERS RECEIVED ON  
THE DRAFT EIS**







## SECTION 4 - COMMENT LETTERS RECEIVED ON THE DRAFT EIS

### 4.1 INTRODUCTION

The following comment letters were submitted by the public and interested agencies during the comment period (April 21, 1995 through June 12, 1995) on the Moxa Arch Draft EIS. A total of twenty-three comment letters were submitted during this time. The comment letters are reproduced in this section. Each letter is given a unique identifying number. Substantive comments requiring a response are identified by comment number associated with heavy vertical lines in the margin of each letter. For instance, comment No. 3-2 is the second comment on comment letter No. 3 requiring a response. All responses are presented in the following Section 5. Each response identifies the letter and comment number that it is associated with.



COMMENT LETTERS RECEIVED ON THE DRAFT EIS

---

This page is intentionally left blank.



Comment Letter #1

WYOMING ADVOCATES FOR ANIMALS  
316 East Pershing Boulevard  
Cheyenne, WY 82001

May 9, 1995

Bureau of Land Management  
Rock Springs District Office  
P. O. Box 1869  
Rock Springs, WY 82902-1869

Re: Fontenelle Natural Gas Infill Drilling  
Projects Draft EIS - April 1995

Expanded Moxa Arch Area Natural Gas  
Development Project - Draft EIS -  
April 1995

BTA Oil Producers Bravo Field Development  
EA - May 1995

Gentlemen:

The grandiose plans set forth in the above three referenced projects do little more than, quite literally, tear up the countryside. While all the volumes involved are massive in content and physical weight, there is little of real substance, an almost total lack of support by science reasoning, a great deal of contradiction, and, more importantly to us, no real protections for wild horses and other native species. It matters little that hunting, for instance, is said to potentially suffer little disruption. What does matter is, that in spite of comments to the contrary, there will be major disruptions and impacts against wild horses and other native species. These natural gas fields are too concentrated in the areas for which they are planned, and while valuable as this type of resource, the cost to other resources is far too great.

Cancel.

Yours truly,

*Jeannine R. Stallings*  
Jeannine R. Stallings  
President

Comment Letter #2

Office of Planning and Development  
Lincoln County, Wyoming

P. O. Box 468  
Kemmerer, Wyoming 83101  
(307) 877-9056

1-800-442-9001 (in Wyoming)  
FAX: (307) 877-3101

DATE: May 12, 1995

TO: Bill McMahn, Project Coordinator

FROM: Randy Wilson, Director *RW*

RE: Lincoln County's comments on the Draft EIS for the Expanded Moxa Arch Area Natural Gas Development Project, Sweetwater and Lincoln Counties, Wyoming.

The Lincoln County Board of County Commissioners has the following comment with regard to the above mentioned Draft EIS.

The Lincoln County Board of County Commissioners supports drilling and production of energy resources. The Board recommends that the review process proceed without unnecessary delays such that the project may be developed in a timely manner.

Comment Letter #3

Lloyd Dorsey  
P.O. Box 567  
Wilson Wyoming 83014  
307-733-4746

June 4, 1995

To:  
Bureau of Land Management  
Bill McMahan, Project Coordinator  
Box 1869  
Rock Springs, Wyoming 82902-1869

Re: Comment on DEIS on Moxa Arch Area Natural Gas Development Project

To the BLM:

Even though the Moxa analysis area is no longer pristine as a result of continued mining and hydrocarbon extraction and transportation activities, the proposed Moxa Arch Area Expanded Natural Gas Development Project will further and needlessly degrade the ecosystem in the analysis area and should not be allowed.

The following are some of the objectionable impacts that will arise if the project is approved and 1325 gas wells are added to the 1119 existing wells, as well as 795 miles of new roads and 1458 miles of added pipelines:

- 3-1 Loss of wildlife habitat for sagebrush/grasslands dependent species such as pronghorn antelope, sage grouse, prairie dog, and ferruginous hawk. Direct habitat loss will be compounded by displacement from habitat of these same species due to the presence of human activities associated with the construction and operation of wells and additional facilities.
- 3-2 Adverse Visual Impacts will be severe, even beyond existing visual degradation, if the 1325 additional wells and associated facilities are allowed. Large sections of this area were recently nationally renowned for their presettlement-like visual integrity which will be forever lost if the project is allowed.
- 3-3 Recreation Values in this area are already strained compared to a few short years ago. Campers, hunters, hikers, wildlife enthusiasts, and natural landscape admirers will be permanently displaced by the proposed project. Solitude and isolation from adverse human activity were recently one of the most beneficial attributes of the Moxa analysis area; with the proposed project in place, these characteristics, all too rare in our society, will be no more.
- 3-4 The greater good for the public at large should outweigh the temporary financial benefits to private corporations of gas development in this area. The preservation of intact sagebrush/grasslands ecosystems and the wildlife species dependent on them, and the visual aesthetics inherent in such natural systems, are of inestimable value to future generations of Americans.

continued on next page.....

comment on Moxa Arch gas development  
to Bill McMahan from Lloyd Dorsey  
page 2

It is for the above reasons that I recommend **Alternative B- the No Action Alternative.**

Thank you for your consideration of this matter.

Sincerely,

*Lloyd Dorsey*  
Lloyd Dorsey

Lloyd Dorsey  
P.O. Box 567  
Wilson Wyoming 83014  
307-733-4746



Comment Letter #4



United States Department of Agriculture

Forest Service

Intermountain Region

324 25th Street Ogden, UT 84401-2510

File Code: 2580

Date: JUN 5 1996

Routing slip table with columns for AD, RPLM, MALLA, GCS, CF, LEAD AGENC.

Vertical stamp: JUN 7 1996, RECEIVED, JUN 1 - JUN 5 1996

Mr. Alan R. Pierson Wyoming State Director Bureau of Land Management P.O. Box 1828 Cheyenne, Wyoming 82003

Dear Mr. Pierson:

This letter is in response to three separate draft Environmental Impact Statements (EIS's) issued by your Rock Springs office and dealing with potential gas well developments in southwest Wyoming.

The due date for comment on the Texaco EIS has expired, and the remaining EIS's have due dates of June 6 and June 12. The Bridger-Teton National Forest, which has been given lead responsibility for Air Resource monitoring in the Upper Green River Basin, had no advance notice and was not included on the mailing list for these EIS's.

Mr. Bill McMahan of your Rock Springs office, has assured us that every effort will be made to satisfy our needs for additional information and recognize our authority as the federal land manager responsible for protecting the AQRV's in these Class I Wildernesses under the Clean Air and Wilderness Act provisions.

We have identified the following as major information needs and deficiencies of the EIS's:

4-1 1. No air quality analysis was provided in the EIS's for Fontenelle Natural Gas Infill Drilling or Texaco's Stagecoach Draw Unit. We believe air quality analysis for these EIS's would be necessary.

4-2 2. None of the EIS's evaluated cumulative effects upon air quality. The only analysis presented in the Moxa Arch EIS, evaluated the effect on the basis of one well only. Sufficient analysis would need to consider the cumulative effects of all the wells.

Caring for the Land and Serving People

Printed on Recycled Paper PS-600-230 (1-2793)

Mr. Alarr Kaestle Ltr.

2

4-3 3. The Moxa EIS used only the proposed wells in their unit rather than considering all the new wells which could be drilled under all existing permits and the other EIS's. The number of all new wells could reach 4,281. All potential new wells, regardless of permit status, must be evaluated for possible effects upon the Class I Wilderness AQRV's.

4-4 4. The Moxa EIS considered background emissions based upon 1983 data rather than current emissions. The effect of current emissions and proposed emissions from new wells will need to be evaluated.

4-5 5. The Moxa EIS evaluated only the emissions expected from the drilling phase. If there are any emissions to be expected from the producing wells which result after initial exploration, an estimation of the producing wells effect is also required in a cumulative manner.

4-6 6. The supporting facilities needed for a potential development of this magnitude were not considered in the analysis of emissions and the associated effects. Dehydration units and compressor stations will certainly be part of the well field development as well as possible refining facilities in case changes in the composition of the gas is encountered. The effects of these facilities need to be evaluated.

4-7 7. A major revision in the modeling of visibility will be necessary. The use of VisScreen in the Moxa EIS is not appropriate for adequately showing dispersion effect upon visibility in the Wildernesses. The Forest Service will be recommending a more appropriate model for visibility analysis.

4-8 8. The Bridger-Teton National Forest has recently completed refinement of a model which predicts changes in high alpine lake chemistry due to the atmospheric deposition of acid ions. This model is state-of-the-science and has been adapted specifically for the western United States alpine environment. The Forest Service will require the use of this model for predicting changes in the lake chemistry, which can then be compared to established limits for the Wildernesses.

4-9 9. There was no discussion of methods to mitigate, if not eliminate, the major pollutant NOx. NOx has potential effects upon lake acidity, visibility, and plant growth (through its role in ozone production). Measures to mitigate NOx need to be fully explored.

4-10 Using the information supplied in the EIS, a very preliminary analysis by our staff suggests that the effect upon the buffering capacity of the more sensitive lakes in the Wind River mountains could result in a reduction of acid neutralizing capacity of more than 10 percent. 10 percent is the maximum decrease allowable under the Limits of Acceptable Change established for these Class I Wildernesses. We want to underscore the importance of the information needs and deficiencies listed above.

We look forward to a closely coordinated and cooperative effort with the Bureau of Land Management as both agencies deal with this major development.

Sincerely,

Signature of Dale F. Bosworth, Regional Forester, Intermountain Region

Signature of Elizabeth Estill, Regional Forester, Rocky Mountain Region

Comment Letter #5



Amoco Production Company

Northwestern U.S. Business Unit Amoco Building 1570 Broadway Post Office Box 800 Denver, Colorado 80201 303-830-4040

June 8, 1995

Bureau of Land Management Expanded Moxa Arch Natural Gas EIS Bill McMahan, Project Coordinator P.O. Box 1869 Rock Springs, WY 82902-1869

Comments on Expanded Moxa Arch Area Draft Environmental Impact Statement

Amoco Production Company (Amoco), a subsidiary of Amoco Corporation, is incorporated for the purpose of exploring for and developing oil and gas resources throughout the United States. Amoco has extensive federal leaseholdings throughout the western U.S., and a continuing interest in the federal land planning process.

5-1 Page 2-5, 2.2.1, bottom of 1st bullet: "Following the on-site evaluation, the applicant would file the application which would include site-specific construction plans where necessary to describe the proposed development (i.e., drilling plans with casing/cementing program; surface use plan with detailed engineering design, reclamation plans, etc.)."

5-2 Page 2-10: This diagram is not entirely correct. Although the approximate total area of reclamation is correct, the site layout would not necessarily be as depicted due to some time required for reclamation of pits.

5-3 Page 2-12, column 2, para 3: "Roads would be designed to minimize disturbance and would be built, graveled, and maintained as specified by the BLM..." Amoco believes that graveling should be a negotiable item and not dictated by the BLM.

5-4 Page 2-14, column 1, para 2: "Resource roads to producing well sites would be graveled within one year following successful drilling, or within one year from when the well goes to production." See above comment. Suggest wording is changed to "When necessary, resource roads..."

Moxa Arch Draft EIS 06/08/95 Page 2

5-5 Page 2-33, column 1, para 1: "...the lead operator (the operator with the greater number of wells) will be responsible for administration of the formal or verbal road maintenance agreements." Suggest wording is changed to "...the lead operator (the operator with the greater number of federal wells) will..."

5-6 Page 2-33, column 2, "Transportation": "The operators would jointly develop an area-wide transportation plan..." It is unrealistic to expect that there can actually be a usable, specific transportation and road network plan for all of industry for the next 5 to 10 years.

5-7 Page 2-34, column 1, para 2: "Areas of high paleontological potential will be surveyed by a qualified paleontologist on a project-by-project basis..." If we are understanding this correctly, areas of "high paleo potential" include all areas of Bridger Fm and Green River Fm shown on Exhibit 3-2, page 3-9.

5-8 Page 2-34, column 1, para 6, (#4): "Construction with wet or frozen soils will be prohibited." We suggest that this wording is changed to "Frozen or saturated soils will not be used as construction material." This clarifies what is meant by the statement.

5-9 Page 2-36, column 1, para 8, (#5): "A site-specific survey for plant species of concern and their habitat would be completed for the Moxa analysis area prior to initiation of any ground-surface disturbance." Exactly what role is industry expected to take? We believe it is the BLM's responsibility to do this during the on-site. Industry funded an extensive vegetation technical report in connection with this EIS, and BLM should be willing to take some responsibility for the follow up work rather than expecting industry to hire a consulting botanist to do these surveys.

5-10 Page 2-37, column 1, 1st full para, (#10): "Provide for sage grouse lek protection during the breeding, egg-laying and incubation period (normally March through mid-June) by restricting

commdrf.doc



Moxa Arch Draft EIS  
06/08/95  
Page 3

5-10  
Cont.

construction activities within a two-mile radius of active sage grouse leks." This statement is not supported with scientific evidence explaining the necessity for a two-mile radius; therefore, we question the need for it. In the past, this has always been one quarter mile, and the dates have been March 15 through May 31. The change has not been justified. Suggest revising wording to say "Provide for sage grouse lek protection during the breeding, egg-laying and incubation period (normally March 15 through May 31) by restricting construction activities within one quarter mile of active sage grouse leks."

5-11

Page 4-14, column 1, para 2: "Operators are beginning an area-wide transportation plan..." See comment referring to Page 2-33, column 2, "Transportation".

5-12

Page 4-66, Column 1, bottom of first full para: "The Moxa operators should, in coordination with the BLM and WGFD, develop a habitat enhancement plan that would mitigate the sage grouse nesting habitats that would be eliminated by construction and operation of production wells." The need for a habitat enhancement plan for sage grouse has not been demonstrated. Industry has supported and funded numerous "plans" and "programs" as the result of various EISs, and should not be required to fund yet another one that is of questionable value. Suggest removal of this measure.

5-13

Page 4-66, Column 2, first full para: "The total impact to antelope crucial winter range would be reduced over the long term by the reclamation of approximately 9.45 acres of habitat associated with each well..." Where did the 9.45 acres come from? Is there an inconsistency between this number and the number used in other sections of the EIS?

5-14

Page 4-66, Column 2, last para: "Because sage grouse surveys were initiated too late in the season (early May) to adequately assess the status of most leks, additional aerial and ground surveys should be conducted prior to construction..." BLM apparently instructed the consultant to go ahead and do surveys (and industry to go ahead and fund them) even though it was not the right time of year. It would have been more cost effective for everyone if industry had been told before the surveys were done that they would be inadequate and would have to be redone. Now, it sounds as if BLM or the operator will have to take care of doing these surveys. Does BLM plan to fund additional aerial surveys? Industry has paid for this once (done by a consultant under the guidance of the BLM), and should not be expected to carry out maintenance and follow up work. This is the BLM's responsibility.

5-15

Page 4-67, Column 1, first full para: "Additional aerial and ground surveys should be conducted prior to construction, during the peak of nesting activity..." Please see above comment on sage grouse surveys.

5-16

Page 4-83, Column 2, "Mitigation Summary", bullet 2: "Restrict drilling on all Class III areas visible from the locations noted above to two drill sites per square mile." This is potentially very restrictive to industry. There are alternatives which would preserve the visual resources of the area, such as using appropriate colors for equipment, low profile tanks, etc. Suggest wording is changed to: "Restrict drilling, where feasible, on all Class III areas visible from the locations noted above to two drill sites per square mile. Where not feasible, employ visual resource protection measures such as..."

5-17

Page 5-1, Column 2, para 3: "Approval of individual project components... would be contingent upon a site-specific cultural resource file search and Class III cultural clearance,

commdrft.doc

Moxa Arch Draft EIS  
06/08/95  
Page 4

5-17  
Cont.

paleontological clearance, special status species surveys, site-specific environmental assessment (EA), and decisions records for each..." The technical reports done in conjunction with this EIS (funded by industry) provide a thorough synthesis of the data. Again, industry would appreciate clarification as to what is being added to our responsibilities with this EIS, particularly with respect to paleontological clearances, special status plant surveys, and special status animal surveys. It is BLM's responsibility to provide support in these areas. Industry should not be charged with continuing maintenance and follow up work after having funded these technical reports.

5-18

Page 5-3, Column 1, para 2: "The Moxa operators, the BLM, and the WGFD would identify additional opportunities to mitigate for habitat loss..." What kinds of "additional opportunities" does the BLM envision? What would the "monitoring raptor nesting and sage grouse lek use" involve? How far removed from the actual project does "adjacent to the Moxa development" go? There are numerous questions surrounding this issue, and the necessity for additional mitigation is not demonstrated in this EIS. Suggest removal of this measure.

5-19

General comment regarding archeology: An excellent synthesis of archeological data in the Moxa Arch area was completed in conjunction with this EIS (industry funded). The intent was for the BLM to use this data to help create a Programmatic Agreement for archeological work in the area. What is the current time frame for completion of the Programmatic Agreement?

Again, thank you for the opportunity to comment on this EIS.

*J.R. Rutty*

J.R. Rutty  
Environmental Specialist

commdrft.doc



Comment Letter #6

Wyoming Wildlife Federation  
P.O. Box 106, Cheyenne, WY 82003  
Phone 307-637-5433 • Fax 307-637-6629

Bill McMahan  
BLM Project Coordinator  
PO Box 1869  
Rock Springs, WY 82902-1869

June 12, 1995

Dear Mr. McMahan,

Please accept the following comments on behalf of the Wyoming Wildlife Federation regarding the draft EIS on the Expanded Moxa Arch Area Natural Gas Development Project. The Wyoming Wildlife Federation (WWF) represents thousands of outdoor enthusiasts united by a deep commitment to protect and enhance wildlife, habitat and recreational opportunities in the state of Wyoming. In particular, many of our members have real concerns regarding the pace and scope of oil and gas development in Southwestern Wyoming.

6-1

1) Recent figures released by the Wyoming Board of Tourism show a 10% increase in tourism revenues in 1994 from 1993 for the three counties, Sweetwater, Uinta, and Lincoln, affected by this proposed development project. Specifically, traveler expenditures went from \$149,280,000 to \$164,300,000. This revenue is directly attributable to the popularity of natural destinations such as the Flaming Gorge National Recreation Area, Fontenelle Reservoir, Seedskadee National Wildlife Refuge, and the Red Desert. The DEIS inadequately addresses the impact of the project on revenues to the counties from recreation. For example 3.14.1 talks about local economy, subsequently focuses on oil and gas industry contributions, yet neglects any specific data regarding projected deleterious effects to local economy that depends upon recreation industry. Please provide a more detailed analysis of recreation income in the final EIS (FEIS) than that provided in table 3-22.

6-2

2) The majority of our members enjoy big game hunting that requires the responsible use of firearms. We are extremely concerned that statements in the DEIS imply that traditional hunting opportunities would be denied in areas of this project. In particular, 4.13 states, "An increase in drilling and production facilities would also cause a safety hazard to those recreationists who continue to hunt in their traditional hunting areas. Also, 4.9.3.1.2 ( pg. 4-51) states, "If hunting within the well field is prohibited (e.g. for safety reasons)..."

WORKING TODAY FOR WILDLIFE'S TOMORROW!

Wyoming Affiliate of the National Wildlife Federation



6-2  
Cont.

These statements suggest that BLM lands, all designated as multiple use lands, in this case are designated as "dominant use". We are alarmed that the development of this project appears to take absolute precedence over other traditional uses, such as rifle hunting. Please explain how this is possible. If BLM intends to limit or exclude rifle hunting in all or part of the project area we request public hearings around Wyoming to provide the general public additional opportunity to pride their input.

6-3

3) 4.9.3.1.2 states that "antelope are sensitive to disturbance at our near natal sites". It then states that this disturbance depends on how important the analysis area is as a natal site. The DEIS provides no data regarding where antelope natal sites are, their activity, or the importance to the antelope populations as a whole. We are concerned that the project will proceed without adequate analysis, and on the ground data collection, regarding effects to antelope fawning. We request that this information be provided in the FEIS and certainly before this project can be approved by BLM.

6-4

4) 4.9.3.1.1 states that 20,293 acres of wildlife habitat will be disturbed by project development. Yet, the DEIS only addresses "on-site" mitigation measures primarily confined to individual well pad areas. The cumulative impact of over 1300 gas wells, accompanying roads, and increased activity will adversely impact big game populations in the analysis area. Therefore, it seems logical that the analysis area should be considered as a block and mitigation measures must be implemented on the same scale. Thus, we were dismayed that we found no concrete plans for any "off-site" mitigation measures in the DEIS. The FEIS should recommend specific off-site mitigation measures that would provide improvements for wildlife habitat adjacent to the project area, directly fund entities capable of protecting and improving wildlife habitat, and offset any losses of hunting opportunities. The present language in the DEIS describing mitigation measures is imprecise and vague. The FEIS must provide specifics on sources of funding and parties responsible for carrying out any proposed mitigation measures.

6-5

The WWF believes that a project of this scope on our public lands deserves more consideration in the FEIS regarding recreational opportunities and wildlife habitat that would be sacrificed in the face of the proposed development. The area being considered is very popular to the hunters, anglers, hikers, horseback riders, and wildlife of Wyoming. The DEIS suggests that loss of resources important to these people is inevitable in the face of oil and gas industry interests. We strongly disagree with this assertion and encourage the BLM to fulfill their mission to manage these federal public lands for the benefit of all of the public, not just the extractive industry. We look forward to your prompt response to our requests and look forward to the issuance of the FEIS.

Please give me a call if you have any questions,

*Dan Chu*  
Dan Chu  
WWF Executive Director





Comment Letter #7

OREGON-CALIFORNIA TRAILS ASSOCIATION
524 South Osage St. / P.O. Box 1019 / Independence, MO 64051-0519
FAX and Phone: (816) 252-2276

June 10, 1995

1793 (930)
Moxa Arch

OFFICERS
President: David L. Miller
Vice President: William C. Belmont
Secretary: James H. Whisman
Treasurer: Len Wrenschmidt
Director Emeritus: Robert J. Mendenhall

Bureau of Land Management
Wyoming State Office.
P.O. Box 1828
Cheyenne, WY 82003-1828

Assistant Director
James Hunt

In response to the Draft Environmental Impact Statement of the Expanded Moxa Arch Natural Gas Development Project I would like to respond as follows.

Your draft does not make any indication as to proposed well drilling locations and therefore specifics cannot be addressed.

The policy of The Oregon-California Trails Association is to maintain the 1 mile corridor each side of the Trail centerline, making a 2 mile wide corridor total in width along the Trail length. We would like to see this followed throughout the Project.

The next item is roads to reach these locations. We would like to see minimal disturbance to both the Trail crossings and visual intrusion to reduce the impact to this valuable resource. Preferably hold the crossings to existing previously disturbed areas.

The gathering system pipelines should be treated in the same light as roads.

We do not object to drilling operations but would like to meet with the various Company Officials where impacts might occur and have BLM Representative on site as well to discuss problem areas as they surface.

Sincerely,
Bob Renselle
Bob Renselle
Acting for Tom Hunt.

cc: Tom Hunt
Mr. Bill McMahan, Project Coordinator BLM.
Kemmerer Resource Area, BLM
Rock Springs Resource Area, BLM.

DIRECTOR EMERITUS
Robert J. Mendenhall
1600 West Pryorland Dr.
Lawrence, KS 66044
(913) 839-3007

OCTA is a 501(c)(3) Not For Profit Organization - EIN 94-092140

Comment Letter #8

SIERRA CLUB LEGAL DEFENSE FUND, INC.

The Law Firm for the Environmental Movement

1631 Glenarm Place, Suite 300 - Denver, CO 80202 (303) 623-9466 FAX (303) 623-8087

June 12, 1995

VIA FAX AND U.S. MAIL

Bureau of Land Management
Bill McMahan, Project Coordinator
P.O. Box 1869
Rock Springs, Wyoming 82902-1869

Re: Comments on the Expanded Moxa Arch Area Natural Gas Development Project Draft Environmental Impact Statement

Dear Mr. McMahan:

Thank you for this opportunity to comment on the Expanded Moxa Arch Area Natural Gas Development Project Draft Environmental Impact Statement ("DEIS"), issued April 14, 1995. In the interest of brevity, I endorse and incorporate by reference the comments of the Wyoming Outdoor Council, National Wildlife Federation, Sierra Club, and the Greater Yellowstone Coalition. My comments will focus solely on the DEIS's analysis of the cumulative impacts of the Moxa Arch expansion and other oil & gas development in southwestern Wyoming, northwestern Colorado, and northeast Utah ("southwestern Wyoming").

The DEIS fails to comply with the standards established in the National Environmental Policy Act, 42 U.S.C. § 4332 ("NEPA"), and the Council on Environmental Quality ("CEQ") regulations implementing that law. CEQ regulations make plain that the Bureau of Land Management ("BLM") must prepare a programmatic or cumulative environmental impact statement ("PEIS") before leasing and authorizing continued energy mineral development in southwestern Wyoming. 40 C.F.R. §§ 1502.4(c); 1508.7; 1508.25(a). A PEIS is needed to analyze the significant cumulative impacts of current and planned oil & gas development on the region's wildlife, water, and other resources. Authorization of the Moxa Arch expansion or other similar activity before completion of a PEIS would violate NEPA.

Mr. Bill McMahan
June 13, 1995
Page 2

A. NEPA Requires a PEIS When Several Separate Federal Actions Will Have Cumulative or Synergistic Impacts on a Region

NEPA requires consideration of cumulative or synergistic impacts on a region. In Kleppe v. Sierra Club, 427 U.S. 390 (1976), the United States Supreme Court stated that

[NEPA] § 102(2)(C) may require a comprehensive impact statement in certain situations where several proposed actions are pending at the same time. . . . A comprehensive impact statement may be necessary in some cases to meet [NEPA's requirements]. Thus, when several proposals for coal-related actions that will have cumulative or synergistic environmental impact upon a region are pending concurrently before an agency, their environmental consequences must be considered together.

409-410. Factors the Court considered important to determining whether proposed actions are related enough to require a PEIS include the number of agencies involved, proximity of the proposed actions in place and time, and similarity of environmental effects.

Kleppe was applied in a case with facts very similar the situation in southwestern Wyoming. In Sierra Club v. Penfold, 664 F. Supp. 1299 (D. Alaska 1987), aff'd, 857 F.2d 1307 (9th Cir. 1988), the court required a regional EIS because sixty placer mines, concentrated in certain watersheds in Alaska, were causing water quality degradation in several rivers. Only one agency, the BLM, was involved, the mines were all in close proximity geographically, and all operated during the same season. Also, the environmental impacts of the proposed actions were identical. The court observed:

[W]hile the operations are not functionally or economically interdependent, their impacts are interdependent and require common analysis. . . . At the risk of belaboring the obvious, the court holds that transformation of the entire 126-mile length of such a river from a clearwater stream to a silt-laden one is a significant environmental event.

CEQ regulations mirror this case law, recognizing "broad federal actions," "connected," "cumulative," and "similar" actions requiring comprehensive or programmatic EISs. 40 C.F.R. §§ 1502.4(a) and 1508.25(a). These regulations underscore BLM's mandate to identify and consider the cumulative impacts of the current industrialization of southwestern Wyoming.

Mr. Bill McMahan
June 13, 1995
Page 3

The current leasing and development of energy minerals in southwestern Wyoming is identical to the situation in Penfold and falls well within the parameters of Kleppe. Only one agency, the BLM, is involved. Only one type of agency action, leasing of minerals and permission to develop those leases, is being taken. Numerous applications for this identical activity are pending before the BLM at the same time. For example, EISs or EAs for numerous other projects in the region, including Enron Burly, Stagecoach Draw, Fontenelle and Bravo Field, were and are in production at the same time. Some of these sites are adjacent to each other. Numerous energy mineral projects and proposed projects are in close proximity geographically; plotting leases and potential development sites on a map, as BLM has done through its GIS system, clarifies the geographical relationship between the separate leases and development fields. The environmental impacts of the various developments will be very similar. The same resources will be impacted, including antelope and elk herds, air quality, water systems, roads, and vistas.

The DEIS itself names nine specific nearby industrial developments, which are considered cumulatively only for economic purposes. DEIS at 4-94. These projects are barely mentioned elsewhere in the DEIS, and their cumulative impact on several resources is ignored. To paraphrase Penfold, transformation of the entire southwestern corner of Wyoming from open land to an industrial park is a significant environmental event deserving comprehensive decisionmaking. See also NWF v. Benn, 491 F. Supp. 1234 (S.D.N.Y. 1980) (ocean dump site creates a steady stream of activity in a well defined area, requiring PEIS).

B. The DEIS Does Not Adequately Address Cumulative Impacts

The DEIS identifies several areas where cumulative impacts are already occurring. For example, BLM has already identified "livestock distribution, unauthorized grazing, and areas of accelerated soil erosion as range management problems within the analysis area," DEIS at 3-1, and acknowledges that "[g]razing, oil and gas and other mining developments, and poor road construction may further increase the naturally high erosion rates." DEIS at 3-24. Also, nearly 1100 rights-of-way for various uses exist in the area, many of these associated with oil & gas or other mineral development. DEIS at 3-1. Yet no discussion of the cumulative impacts of the current uses and the proposed development on natural resources occurs in the DEIS.

In fact, the existing uses are used to minimize the impact of the Moxa Arch expansion. See, e.g., DEIS at 4-4 (proposed action will not substantially add to the cumulative impacts



Sierra Mt. McKinstry, Ansel Adams

REGIONAL OFFICES
Berkeley, California
Bozeman, Montana
Honolulu, Hawaii
Juneau, Alaska
New Orleans, Louisiana
Seattle, Washington
Tallahassee, Florida
Washington, D.C.



Mr. Bill McMahan  
June 13, 1995  
Page 4

Mr. Bill McMahan  
June 13, 1995  
Page 6

8-3  
Cont.

already occurring in the area); DEIS at 4-77 (the area is not "pristine."). BLM should be aware that NEPA requires analysis of impacts wherever federal action occurs, whether or not an area is "pristine." The fact that previous disturbance is present does not relieve BLM of its obligation to study the impacts of this additional development.

8-4

In addition, the amount of disturbance for cumulative impact analysis purposes is consistently understated. The land area actually disturbed is often cited as ten percent or less of the available acreage, implying that 90% or more of the site area is undisturbed. This analysis artificially limits the impact to actual soil disturbance, which anyone who has ever been to an energy mineral development site knows does not reflect the full impact of that development.

C. The DEIS Fails to Address Several Areas of Concern

8-5

Numerous resources which should be reviewed for adverse cumulative impacts by regional development are either ignored or addressed in a cursory fashion. For example, the DEIS mentions several times that mitigation measures will reduce impacts. While it is legally permissible for an agency to use mitigation measures to reduce the impacts of an action to the point that the impacts are no longer significant, see, e.g., Friends of the Earth v. Jantzen, 760 F.2d 976, 987 (9th Cir. 1985), those measures must be "more than mere vague statements of good intentions." Audubon Soc'y of Cent. Ark. v. Dailey, 977 F.2d 428, 435-6 (8th Cir. 1992). Since no method of enforcing mitigation measures is mentioned in the DEIS, they are no "more than mere vague statements of good intentions," and the DEIS is legally deficient. In addition, since cumulative impacts are not properly addressed, the mitigation measures are entirely site-specific, and do nothing to mitigate adverse cumulative impacts. Opportunities for regional mitigation efforts are ignored.

8-6

One of the most egregious examples of the inadequacy of the DEIS's cumulative impacts analysis is the discussion of impacts on protected plant species. Endangered, threatened and other special status plants occur on and near the Moxa Arch expansion. The Kemmerer cushion plant community, which even BLM acknowledges as important, is very close to Moxa Arch, and many of the same types of plants are located on the site. DEIS at 3-29 and 3-48. The discussion of impacts on vegetation emphasizes mitigation, but BLM knows revegetation is difficult in this region, DEIS at 4-43, and the ability to reclaim habitat for protected plants is uncertain, DEIS at 4-77. In fact, the DEIS actually states

Mr. Bill McMahan  
June 13, 1995  
Page 5

8-6  
Cont.

[T]he potential for cumulative impacts to special status plant species and/or habitats with the action alternatives could be considerable given the propensity of the analysis area to contain special status plants and the lack of comprehensive surveys to identify species and habitat.

8-7

DEIS at 4-77 (emphasis added). The chance of potential cumulative losses are increased because private and state land being developed nearby will not be mitigated according to federal standards. DEIS at 4-43. Amazingly, the DEIS concludes that with avoidance and mitigation measures, "cumulative impacts to special status plant species/habitats are not projected to be significant." How can protected plants be avoided when know one knows their location, or mitigation be effective when the ability to reclaim habitat is "uncertain" and will probably not be attempted on state and private land? This failure to address the true impacts of the Moxa Arch expansion and the industrialization of southwestern Wyoming on plant species violates NEPA. BLM should also be aware of the probability of violations of the Endangered Species Act.

8-8

Impacts on protected fauna are also downplayed. The DEIS relies heavily on existing data sources, including a database from the Wyoming Game and Fish Department. If existing data sources contain no references to protected species, the DEIS assumes no impacts. This leads to faulty conclusions. For example, WGFD's WOS database contains only anecdotal reports by WGFD personnel, recording serendipitous observations made by an employee while performing other tasks. That database is not the result of surveys or other comprehensive studies, and should not be relied on as an authoritative data source. Because of the reliance on faulty data, and the failure to consider regional development, the DEIS fails to account for the true impacts of regional industrialization on protected species.

8-9

The DEIS ignores potential impacts on other wildlife resources as well. While displacement of big game is acknowledged as an impact, the displacement is downplayed since supposedly the game will simply go elsewhere. But BLM knows that cumulative impacts caused by development on surrounding private and public lands will cause long-term significant impacts on several wildlife species. DEIS at 4-67. The artificial definition of "disturbed area," and the lack of analysis of cumulative impacts, means the true impact on wildlife species is not addressed. With so much industrialization in the region, there is no "elsewhere" for wildlife to go.

8-10

As one example, the DEIS recognizes that the impact on antelope caused only by the MOXA Arch expansion could be serious. Loss of forage and cumulative losses of winter range will occur, but lack of data prevents knowing for certain how serious this could be. DEIS at 4-61. After making this statement, the DEIS offers no more analysis than "habitat losses could be mitigated," and "attempts to replace those losses should be made." Id. Another example is the determinations made regarding impacts on birds, even though data has not been collected. DEIS at 4-67. Making determinations without data, failing to specify what mitigation measures must be taken, and ignoring the regional impacts caused by other nearby developments all violate NEPA.

8-11

Cumulative impacts on water and air already known to be caused by the regional industrialization are blatantly ignored. The DEIS acknowledges that groundwater contamination may already be a problem; studies are occurring nearby to determine if contamination has already occurred. DEIS at 3-26. Also, the DEIS discusses water use by mineral development, and states that the cumulative impact of the water that would be withdrawn is unknown. DEIS at 4-37. Many roads and oil and gas development facilities have been constructed in or immediately adjacent to areas subject to flooding, which could contribute to contamination. DEIS at 3-23. Yet no further analysis of impacts of regional industrialization on water resources is given. Some of this may be due to BLM's conclusion that the water is of low quality. DEIS at 3-23 to 24. This cavalier attitude toward water resources is a violation of NEPA.

8-12

The impact of industrialization on the region's air quality is also downplayed. A Clean Air Act non-attainment area exists less than ten miles of the Moxa Arch area, DEIS at 3-4. The DEIS downplays the significance of this because of "the large separation distances between the sites." DEIS at 3-4. See also DEIS at 4-9. No mention is made of the impacts of the numerous other developments nearby. Given the flat, open topography of the region, and the winds common so much of the year, the idea that air pollution will stay near its source, and pollution from one well will never overlap that caused by another, is simply ludicrous.

8-13

Other important resources in the region are a National Wildlife Refuge adjacent to Moxa Arch, several designated recreation areas, historic trails and graveyards, and prehistoric rock art. Loss of these resources is certain if the region is developed in the manner projected, with no plan for the cumulative impacts already known and expected, and lack of knowledge because of inadequate data.

Mr. Bill McMahan  
June 13, 1995  
Page 7

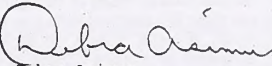
8-14

D. Conclusion

All BLM action granting leases or authorizing lease development in southwestern Wyoming should be postponed until a programmatic or comprehensive EIS is completed. BLM obviously expects heavy energy development in the area in the near future. See, e.g., DEIS at 4-13. As stated above, transformation of southwestern Wyoming from open land to an industrial park is a significant environmental event deserving comprehensive decisionmaking. BLM should serve the interests of both the public and energy industry by completing a comprehensive PEIS for development in southwestern Wyoming to guide the important decisions that will be made in the next few years. Only informed decision making will permit development of needed energy resources without sacrificing other resources that are the property and the heritage of the American people.

Thank you for this opportunity to provide comments. Please do not hesitate to contact me if I can be of any further assistance in this matter.

Sincerely,

  
Debra Asimus  
Associate Attorney  
Rocky Mountain Office



Comment Letter #9



United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Ecological Services  
4000 Morrie Avenue  
Cheyenne, Wyoming 82001

RECEIVED  
JUN 1 1995  
Dept. Of The Interior  
Bureau Of Land Management  
Rock Springs, Wyo.

ES-61411  
mij/WJ.02(expmoxa.scp)

June 12, 1995

Memorandum

To: District Manager, Rock Springs District, Bureau of Land Management, Rock Springs, Wyoming  
From: Field Supervisor, Ecological Services, Cheyenne, Wyoming  
Subject: Expanded Moxa Arch Draft Environmental Impact Statement

Thank you for the opportunity to review the subject document (EIS). As you know, the Fish and Wildlife Service (Service) has commented extensively on past energy development projects in southwest Wyoming, particularly oil and natural gas. Our primary concern is that EISs have not adequately assessed the cumulative impacts of energy development on wildlife resources. Though the Moxa Arch EIS does make some progress in this respect, I still find that the conclusions forwarded in this EIS are generally based on a tally of the number of acres of habitat impacted versus the number of "unaffected" acres, usually resulting in a minimal effect determinations. As I have indicated in several previous responses to energy development EISs and during meetings with the Bureau of Land Management (Bureau), the summation of impacted acres of habitat should represent the first step in cumulative effects analyses. Subsequent steps need to identify the actual biological/ecological cumulative impacts.

During numerous discussions with staff at the state office of the Bureau and with District office staff at the first cumulative effects taskforce meeting and at the Continental Divide Oil and Natural Gas Development planning meeting in Rawlins, it became obvious that adequate information was not currently available to effectively assess cumulative impacts on wildlife resource. The fundamental problem identified during these meetings is that the magnitude and extent of issues that should be addressed by cumulative effects analyses have not been addressed. Though I understand the difficulty in identifying adequate techniques for assessing cumulative effects, I believe the more immediate concern should be securing financial resources for Bureau efforts such as the Southwest Wyoming Evaluation and Cumulative Effects Taskforce. Although these programs have been initiated by the Bureau to address cumulative impact concerns, their schedules and budgets do not reflect a firm commitment by the Bureau to assess and modify Bureau actions to reduce surface

resource cumulative impacts. Without secure funding, Bureau initiated programs are unlikely to provide timely information regarding cumulative impacts associated with energy development.

Because the proposed action is one of many ongoing and proposed energy development projects in Wyoming and therefore contributes incrementally to the cumulative impacts on surface resources, I believe the draft EIS should discuss how concerns about cumulative impacts are currently being addressed (i.e. Southwest Wyoming Evaluation, Cumulative Effects Taskforce, Continental Divide Project Planning, etc.). Including information on Bureau direction with respect to cumulative effects analyses would provide some indication to readers that although the Bureau can now only tally acres lost, proposed and ongoing analyses may provide more substantial biological/ecological evaluations in the future.

Until sufficient information is available to adequately assess the cumulative effects of energy development in Wyoming, I believe the Bureau is compelled by the National Environmental Policy Act to disclose that relevant information needed to make "no significant impact" determinations is lacking. To do otherwise may result in false conclusions about cumulative impacts based on inadequate or unsound biological information.

Below, please find my specific comments and concerns regarding the draft EIS.

Page 1-1, Project Background - Based on the summary of historic drilling within Moxa Arch, a total of about 711 wells should be present in the field (312 wells at the time of the 1991 Decision Record/Finding of No Significant Impact, 149 additional wells through July 1992, and about 250 additional wells after the 1992 supplemental Environmental Assessment). However, on page 1-9, the EIS indicates that 1,119 wells have been drilled. What documentation or NEPA compliance was conducted for the 408 wells not covered under the documents listed above?

Page 2-8 and 2-19 - I applaud the Bureau of Land Management's (Bureau) recognition of directional drilling as a viable alternative to reducing surface impacts. I also understand the difficulty in predicting the number of wells that may be directionally drilled. However, I do believe that this drilling technique may be required to offset surface disturbances in some cases. Page 4-48 suggests that directional drilling may be used as a form of mitigation to off-set impacts to pronghorn antelope and livestock. Although the impacts of oil and gas development on big game species may be better understood, I believe that application of directional drilling can also benefit other wildlife resources. The option for implementing this drilling technology was also included in the Raptor Management Plan developed for another natural gas development in northeastern Wyoming and is discussed later and in accompanying documents.

Page 2-29 - Produced water pits result in avian and bat mortality. To ensure compliance with the Migratory Bird Treaty Act, the Bureau shall require all produced water pits be netted. Specifically, a mesh netting should completely cover the pit. The largest mesh size

9 - 4  
Cont.

recommended is 1 5/8 inch. A support structure made of four or five inch casement pipe set in cement at 10 foot intervals and at least three feet deep, with cement poured into the centers is recommended. Crossbraces of aircraft cable with turnbuckles should be strung across ponds to hold the net and eliminate sags that may tear in the wind. Cables or UV resistant rope on top of the net will limit whipping in the wind.

9 - 5

Page 2-33 and 4-14, Transportation - I suggest that one or more biologist have input into the area-wide transportation plan. Biologists will be able to provide insight regarding sensitive areas that may require an emphasis on minimizing road impacts.

9 - 6

Page 2-36, Wildlife - Measures six and seven are not effective in protecting the long-term productivity within raptor nesting territories. Timing restrictions do provide protection during the year of construction, but do not protect nests into the future. In many cases, production facilities are located immediately adjacent to (within 1/4 mile) of nests that produced young. For some raptor species, particularly ferruginous hawks, this close juxtaposition may be unsuitable, and nests near facilities may not be used again. Although the loss of one nest within the range of raptor nesting territories may not result in an overall impact, the proposed development density (four wells per section) provides little or no opportunity for raptors to exploit the remainder of their territory. In essence, the proposed level of development will likely reduce long-term productivity of some raptor species within the Moxa Arch area.

To minimize impacts of infield and expanded field development on nesting raptors and the possibility of the Bureau and producers being at risk for taking under the Migratory Bird Treaty Act, the Service believes that additional protective measures are needed. Faced with similar raptor nesting/energy development issues, the Service, in consultation with the Bureau's Platte River Resource Area and producers, developed a raptor management plan for the Cave Gulch Field Development. I have attached pertinent sections of the Cave Gulch Environmental Analysis and Raptor Management Plan (Plan) for your review. Though the Plan provides a good starting point with which to develop protective measures for the Moxa Arch area, I believe its applicability can be refined for Moxa Arch. You will also notice that the amount of information required for development of the Plan was greater than was provided in the EIS for Moxa Arch.

In order to obtain sufficient information to develop a timely Raptor Management Plan for the Moxa Arch area, I recommend our staffs meet soon to discuss data needs and management alternatives. Mike Jennings, of my office, will be the Service contact for this project.

9 - 7

Page 2-37, Wildlife - Section 11 addresses prairie dog/black-footed ferret survey requirements, indicating that consultation with the Service will be initiated, if necessary. Based on the information provided on prairie dog town/colony/complex size and distribution within the analysis area, I believe that any surface disturbing activity that will involve prairie dog burrows will require black-footed ferret surveys, in accordance with the Service's 1989 Black-footed Ferret Survey Guidelines. As indicated in the EIS, ferret surveys must be

completed no more than 12 months prior to construction activities.

The Service is also interested in maintaining the size and distribution of the prairie dog complex in this area. As noted in the EIS, complexes in excess of 1,000 acres may provide suitable sites for future reintroductions. Though we currently do not maintain a list or mechanism for prioritizing potential future release sites, information on the size and distribution of large complexes, such as that observed in the Moxa Arch area, are valuable. Provided the captive rearing program successfully produces sufficient young to fulfill the current demand at existing release sites, the Service may eventually seek additional reintroduction sites. To ensure the Moxa Arch complex retains its current value as a potential reintroduction site, the Service recommends the following actions be implemented during development of the field:

9 - 7  
Cont.

Site Access and Preparation

- Align roads to avoid significant effects to prairie dog colonies and sensitive vegetation.
- Install adequate devices to maintain natural waterways and prevent erosion. Changes in water flow regimes can cause unnecessary flooding of prairie dog burrow systems.
- Incorporate present and future land uses in the design and alignment to minimize total habitat loss and repeated disturbances.
- Use the minimum width roadway necessary to meet short and long-term land use plans.
- If roads cannot avoid prairie dog colonies, design and lay-out access roads that cross prairie dog colonies through: (1) the lowest prairie dog density areas (< eight burrows per acre), (2) the edges of prairie dog colonies, and (3) the shortest transect of the colony as possible.

Wellsite Construction

- Avoid locating wellsites in prairie dog colonies or use directional drilling techniques.
- Minimize area affected by containing equipment and activities within the wellsites and rights of way.
- Wellsites in prairie dog colonies should be located in low density prairie dog areas (< eight burrows per acre).

Long-term Production



- Establish treatment and storage facilities off prairie dog colonies.
- Oil residue and other contaminants from mud pits may be hazardous to wildlife. Remove hazardous materials to an approved offsite facility before filling and reclaiming pits.
- Mitigate significant habitat disturbances and loss occurring on colonies.

Placement of Centralize Production Facility

- These facilities should be located off prairie dog colonies.

Pipeline Installation

- Avoid placing pipelines through prairie dog colonies.
- Where avoidance is not possible, pipelines should be routed through prairie dog colonies less than 30 acres and with prairie dog burrow densities less than eight burrows per acre.
- In larger colonies, pipelines should transect the colony at its narrowest point and near the colony edge to minimize disturbances within the colony.
- Topsoil salvage and the double-ditching technique should be considered whenever burying large pipes. While this may disturb more surface, more rapid reclamation of vegetation should also occur. To minimize disturbance for smaller pipes, options such as the use of direct burying, pulling pipe, and other methods should be explored.
- Prevent waste water discharges in or near prairie dog colonies, unless appropriate State and Federal water quality standards are met. Even then the quantity of discharge should not result in burrow inundation.

Spills and Cleanup

- Low-impact cleanup techniques should be used for spills within 1/8 miles of a prairie dog colony. Carefully consider the effects of dispersants, emulsifiers, and other chemical agents on prairie dogs and vegetation in the cleanup strategic plan.
- Spills not on prairie dog colonies should be contained to avoid contamination of nearby prairie dog colonies.

Abandonment

9 - 7  
Cont.

- Due to the fossorial activities of prairie dogs, burial of drilling mud and other wastes must be carefully engineered, monitored and coordinated. Waste removal from prairie dog colonies is recommended to avoid future significant impacts.
- Habitat enhancements may be recommended in some areas to encourage prairie dogs.
- Removal of concrete or other impervious surfaces and equipment is beneficial and recommended.
- Dry hole markers greater than 12 inches above ground level should be avoided or made inaccessible for raptor perching. Retrofitting existing dry hole markers to discourage raptor perching is also recommended.

Page 2-44, 2-45, 4-44, and elsewhere - The maintenance of Wyoming Game and Fish Department herd or population objectives has no biological meaning with respect to maintaining ecosystem/landscape functions and values. Also, the sections dealing with compliance with either Department or Bureau objectives and stipulations provide no useful information with which to compare impacts of the proposed action and alternatives.

This table also provides a summary of determinations regarding the significance of impacts to listed and candidate plant and animals. In all cases, the EIS indicates that impacts are not likely to adversely affect or are not likely to contribute to the need to list. I believe these statements are presumptuous, at best, considering the lack of information regarding population status, distribution, habitat preferences, etc., for most of the candidate species occurring in the Moxa Arch area. As discussed later, these determinations are based solely on the amount of acreage disturbed relative to the amount of available habitat types, and not on the biological needs/requirements of these species.

For listed fish species, this table is incorrect. Although we now have a mechanism to offset impacts from water depletions, any water depletion from the Colorado River basin is considered to jeopardize the continued existence of the four listed downstream species. Therefore, with regard to listed fish, the proposed action and alternatives, should indicate that they will result in a "may affect" situation.

Page 3-40, Raptors - As discussed above, the baseline information provided for raptors is currently insufficient to fully evaluate impacts to nesting raptors. The lack of raptor nesting information is somewhat baffling considering that an Environmental Assessment was conducted just four years ago. Are there any data available from that assessment that could be used for comparative purposes? If not, I assume the only information that we have to work with is the 1994 survey which was conducted too early to adequately evaluate nest use, not to mention nest success or productivity. Are more thorough surveys being conducted this spring?

9 - 7  
Cont

9 - 8

9 - 9

9 - 10

Page 3-48, Special Status Species - Thank you for information regarding the distribution of candidate species within the analysis area. As indicated above, the high quality of mapping provided for the prairie dog complex in this area will be useful if future reintroductions are considered for this complex.

9 - 11

Page 4-38, Impact Significance Criteria - What is the biological/ecological significance of the 10 percent threshold for vegetative removal?

9 - 12

Page 4-42, Wetlands - It is not clear how application for a 404 permit would remove the potential for significant cumulative impacts to wetlands. Issuance of the 404 permit only provides the regulatory authority necessary to impact wetlands and does not mitigate or offset the impacts.

9 - 13

Page 4-42 and 4-43, Mitigation Summary - Application of standard Bureau stipulations to protect wetlands do not address all practicable means of reducing impacts. Except for situations where rerouting access roads could not avoid wetlands, all construction could, and should be located outside of wetland areas. To my knowledge, there are no expansive wetlands in the area where total avoidance would preclude reservoir development. Relocating pad sites or use of alternative drilling techniques appear to be practice means of avoiding wetland impacts.

Mitigating unavoidable wetland impacts (which should be much smaller than the 223 acres identified on page 4-41) should be addressed by development of a comprehensive wetland mitigation plan similar to that proposed for wetland banking in the draft EIS. Treating each wetland impact as a separate project will provide no opportunity to develop a larger on-site mitigation project that would potentially cover all or a large portion of the impacts associated with Moxa Arch. In order to offset wetland impacts, the Service generally requests that mitigating measures be implemented prior to actions that destroy or modify existing natural wetlands. In this respect, the wetland banking concept reference on page 4-43 may be more applicable, except that banking wetland credits also requires establishment of man-made wetlands prior to drawing credits from the bank. Given the historic rate of development associated with oil and natural gas, I doubt that ecologically functioning wetlands can be created and used as credit within the timeframes of infield and expanded field development in the Moxa Arch field. I would, however, encourage development of a comprehensive mitigation plan that identifies potential mitigation sites, a commitment by the producers to purchase/lease suitable site(s), and a schedule of mitigation actions.

9 - 14

Page 4-44, Inventory and Monitoring - No inventory efforts are identified

9 - 15

Page 4-44, Impact Significance Criteria - As mentioned above, maintenance of Department herd objectives has no biological validity as a significance criteria. Also, I believe that the current timing stipulations do not ensure long-term protection of raptor nesting territories. Protection of nests during construction does not ensure that facility placement and operation will not affect the productivity of individual nests or nesting territories in the future.

9 - 15

Cont.

Therefore, from the Service's perspective, the criteria regarding disruption of grouse and raptor breeding and nesting activities is violated.

9 - 16

Page 4-45, General Wildlife - This section provides an accurate reflection of the current knowledge regarding non-game, candidate, and sensitive species. Given that little is known about habitat use and distribution of these species, the analyses correctly indicates that the impacts to many species is not quantifiable. However, this, and other sections throughout the EIS do not take the next logical step in identifying data/information needs necessary to adequately evaluate impacts to wildlife resources. These needs should be addressed under the Inventory and Monitoring section discussed above.

9 - 17

Page 4-52, 4-66, and 4-67 - Given the inadequacy of existing timing restrictions for the protection of raptors, the lack of basic information, the magnitude of development, as well as the probable impacts that occurred historically at the Moxa Arch field, I do not concur with your assessment that the proposed action will avoid significant impacts. As discussed above, development and implementation of a Raptor Management Plan is necessary, from the Service's perspective, to minimize project impacts to nesting raptors.

9 - 18

Page 4-68, Special Status Animals - Again, non-compliance with wildlife management objectives has no biological/ecological meaning. Impacts would also be significant if actions were not in compliance with the Migratory Bird Treaty Act or Eagle Protection Act. As mentioned above, the Service does not believe that timing restrictions alone protect nesting raptors over the long-term, so from our perspective, the proposed action may result in significant impact under bullet three of this section.

9 - 19

Page 4-68, Special Status Fish - The proposed action technically exceeds the significance criteria based on the "may affect" determination related to water depletion and impacts on downstream listed species, even though regulatory mechanisms are now in place to offset impacts and jeopardy to these fish species.

9 - 20

Page 4-68 and 4-69, Special Status Plants - This section provides a "not likely to adversely affect" determination for the Ute-ladies tresses orchid, based on implementation of standard mitigation and Bureau stipulations. Although these measures may reduce impacts to the orchid and other sensitive plant species, the EIS also suggests that low to moderate value orchid habitat may be adversely affected by channel crossings. Based on this assessment, it is clear that sufficient protection for the orchid is not provided under existing stipulations and proposed mitigation. To ensure adequate protection of this species, I request that the Bureau require habitat and/or flowering plant surveys prior to surface disturbance. Service requirements for conducting orchid surveys are attached for your review and use. Only if surveys are conducted in accordance with these requirements and suitable alternatives can be developed to eliminate impacts to this species, could I concur with your determination that the orchid is not likely to be adversely affected by the proposed project. If orchids are found, you should contact this office regarding development of protective measures.



9-21

Page 4-69 and 4-70 - Minimization of impacts to ferrets are satisfactorily addressed in this section. To ensure actions within Moxa Arch also minimize impacts that might affect the suitability of the prairie dog complex to serve as a potential future reintroduction site, the recommendations provided above should also be incorporated into the development plan for Moxa Arch. Provided these measures are implemented, where appropriate, and ferret surveys are conducted pursuant to the Service's 1989 Black-footed Ferret Survey Guidelines, I concur with your determination that the proposed project is not likely to adversely affect ferrets. Given the type of disturbance and infrequency of occurrence within the Moxa Arch area, I also concur with your determination that the proposed expanded and infield development is not likely to adversely affect the bald eagle, peregrine falcon, or whooping crane.

9-22

Page 4-73, Ferruginous Hawk - The ineffectiveness of timing restrictions to protect nesting raptors has been addressed elsewhere.

Page 4-73, Mountain Plover - I agree that surveys should be conducted for this species where suitable nesting habitat exists. Below, please find the Service's recommended survey guidelines.

9-23

Visual observation of the area within 1/4 mile of the proposed action and 100 yards of proposed access routes should be made to detect the presence of plovers. All plovers located should be observed long enough to determine if a nest is present.

These observations should be made from a stationary vehicle, as plovers do not appear to avoid vehicles.

If no visual observations are made from vehicles, the area should be surveyed on ATVs. Extreme care should be exercised in locating plovers due to their highly secretive and quiet nature. Surveys by foot are not recommended because plovers tend to flush at greater distances when approached using this method. Finding nests during foot surveys is more difficult because of the greater flushing distance.

Surveys should be conducted no more than 14 days prior to the date actual ground disturbance activities begin. If two surveys are required, they should be made at least 14 days apart, with the last survey no more than 14 days prior to the start-up date.

The number of surveys required to clear a site for mountain plovers prior to beginning a planned activity is dependent upon start-up date.

The number of surveys required to clear a site for mountain plovers prior to beginning a planned activity is dependent upon the start-up date, as shown below:

| <u>Date of planned activity</u> | <u>Number of surveys required</u> |
|---------------------------------|-----------------------------------|
| March 15 through April 15       | 1                                 |
| April 15 through July 15        | 2                                 |
| July 15 through August 15       | 1                                 |

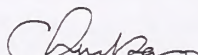
9-23  
Cont.

If an active nest is found in the survey area, the planned activity should be delayed at least 30 days. If a brood is observed activities should be delayed at least seven days.

Grading activities and new road construction should be minimized during the period from May 25 through June 30 to lessen hazards to early developing chicks. More plover activity has been identified on established roads than on two-tracks.

No new surface disturbing activities should be allowed during the reproductive period March 15 through August 15 in identified concentration areas. These are defined as areas where broods and/or adults have been documented in at least two of the past three years.

If you have any questions, please contact me or Mike Jennings of my staff at the letterhead address or phone (307)772-2374.



Charles P. Davis

attachments (2)

cc: Director, WGFD, Cheyenne, WY  
Nongame Coordinator, WGFD, Lander, WY



June 12, 1995

1501 Stampede Avenue  
Cody, WY 82414-4721  
Telephone 307/587-4961

Bill McMahan, Project Coordinator  
Bureau of Land Management  
P. O. Box 1869  
Rock Springs, WY 82902-1869

Re: Expanded Moxa Arch Natural Gas EIS

Dear Mr. McMahan,

Marathon Oil Company appreciates the opportunity to provide additional comments on the Bureau of Land Management's (BLM) Expanded Moxa Arch Natural Gas Draft Environmental Impact Statement (EIS) that was released April, 1995. As the number one liquid hydrocarbon producer in Wyoming as well as being active in this state for over eighty years, our company has a strong interest in the outcome of the management of any public lands in Wyoming.

The following comments are suggested changes to the Draft EIS and additional support information to be considered in the document:

PALEONTOLOGY

The various sections concerning Paleontology appear to present a major policy change which will or may have a major impact on both the BLM and the users of Public Lands. It appears that these changes will cause delays as well as additional monies to be spent for the sole purpose of adding another layer of bureaucracy to an already overburdened system.

10-1

This idea of creating guidelines for Paleontology appears to mirror those of Archaeology, which has proven to be inefficient as well as ineffective. Additionally, Congress is considering a major overhaul of the Archaeological program, especially in its processes. Since Paleontology does not have legislation similar to the National Historic Preservation Act and related regulations, it is unfair to compare archaeology and paleontology rules. The Arch guidelines currently in place are outdated and process oriented as opposed to being constructive and goal oriented. It also appears that the Federal Government is creating jobs where no jobs are needed. This is evident by the requirements in the proposal, as it appears they were written by Paleontologists for the preservation of Paleontologists and not the resource.

A subsidiary of USX Corporation

Bill McMahan, Project Coordinator  
Bureau of Land Management  
June 12, 1995  
Page 2

10-1  
Cont.

Marathon recommends against implementing a new policy for Paleontology unless a problem exists. In the event a change to current practices is warranted, we suggest having a team of field managers and customer representatives review and write a policy from a user and manager perspective prior to finalization.

10-2

WILDLIFE RESTRICTIONS

In general, we believe that the federal agencies do not provide sufficient justifications for surface access restrictions on our industry in order to prevent any possible impact on wildlife. First, this document supports our past statements that the oil and gas industry only impacts less than 5% of the surface lands, yet our industry typically and continually have restrictions placed on our operations due to wildlife. Moreover, there are many documented cases where wildlife not only coexists but reproduce and raise their young next to our operations without problems.

It is also our opinion there are many studies on other sources of impact that can negatively influence wildlife survival more so than our industry. One such example is this draft EIS includes information of the impact on wildlife from drought. Other examples are published articles indicate that predators create a significant impact on wildlife. Recent articles in the monthly publications of "Ducks Unlimited" and "The North American Pronghorn Foundation" are but two sources of studies of the effect of predators. Those articles can be provided to the BLM. It is recommended that both the drought and predator impacts be considered in conjunction with our possible minimal impact prior to proposing any management restrictions on our industry.

10-3

OPERATIONS IN SENSITIVE AREAS

Our industry has explored and developed hydrocarbons in sensitive areas for many years and throughout the world. In 1992, I used a literature search to obtain copies of various articles concerning operating in sensitive areas and submitted them to the Shoshone National Forest personnel for consideration in their leasing EIS. Copies of those thirty-one articles are attached for your consideration in this EIS.

10-4

SOCIOECONOMICS

In general, the Socioeconomics section of this draft EIS is a vast improvement over similar data in prior EIS documents that I have reviewed. Without including all government revenues generated from my industry, elected and appointed officials in this state cannot truly make informed comments on this document for their respective areas of responsibilities. Because of the tax structure and the distribution of the federal royalties and taxes in the state, federal revenues play a key role in the survival of the counties, schools, various state



Bill McMahan, Project Coordinator  
 Bureau of Land Management  
 June 12, 1995  
 Page 3

agencies, etc. in Wyoming. Specifically, on pages 1-17 the wording concerning "economic benefits" should be changed to reflect that those benefits are to all communities in the state because of the tax structure.

10-4  
 Cont.

I would suggest that all of the socioeconomic data be generated for the proposed alternative and alternatives A and B for the life of the project and be presented either in tabular or graphic form for comparison. Additionally, indirect as well as direct economic impacts to the communities should be provided for each of the alternatives. The University of Wyoming, Agriculture Economics Department, has the capability of developing the data to show the impacts from the EIS. The socioeconomic for each alternative should be considerably different and is important for those elected officials to compare in their preparation of comments on the draft document.

**APPENDIX B, RECLAMATION GUIDELINES**

10-5

Section 1.0, page B-2, paragraph 3. When temporary reclamation measures are applicable, topsoil should be respread and left in a rough and furrowed manner following the contours of the land. The furrows will minimize wind and water erosion. Mulching is not necessary, especially if a sterile cover crop is seeded; it will serve as a standing mulch.

10-6

Section 2.0, page B-3 and Section 4.4.2, page B-12, paragraphs 3 and 4 and Tables B-2 through B-10. When reclaiming access road/pipeline ROWs and drill sites, the major goal should be to stabilize the topsoil and prevent its loss. Although the use of native species is important, it is not necessary to try to recreate the climax community when initiating reclamation. Native species adjacent to the disturbed location will provide a seed source and natural succession will occur in the reclaimed area. Native species should be used in the seed mix; however, species such as Wyoming Big Sage (*Artemisia tridentata*) should not be included in the seed mix. The other species in the seed mix will out compete the sage brush for moisture and sagebrush will not grow; this fact has been established in Northeast Wyoming by surface coal mines. The mines have not been successful at reestablishing sagebrush when it is seeded with other native species. Although success is achievable if selected areas are seeded strictly with sagebrush, natural succession will occur on its own and including sagebrush in the seed mix is not necessary. Inclusion of sagebrush is a waste of money and seed.

10-7

Section 4.1, page B-5, paragraph 1 and Section 4.4.1, page B-11, paragraph 1 (COMMENTS ARE THE SAME FOR BOTH SECTIONS). The topsoil depth should be at least four to six inches (or more) if that amount of topsoil is available. However, if the pre-disturbance topsoil

Bill McMahan, Project Coordinator  
 Bureau of Land Management  
 June 12, 1995  
 Page 4

10-7  
 Cont.

depth is less than four to six inches, the topsoil should be respread to a depth commensurate with pre-disturbance conditions. An operator should not be required to replace more topsoil than was originally present on location.

10-8

Section 4.4.3, page B-21, paragraph 3. Although mulch can be spread and cover 75% of the soil surface initially, when the winds of Wyoming begin blowing, even crimped mulch will break off and blow away. Therefore, the requirement that the mulch cover 75% of the soil surface should be required only at the time of application.

10-9

**MONITORING**

Because of 1) the sparse vegetation, 2) the low annual rainfall, and 3) the active grazing in the area, I would recommend that structured monitoring guidelines be deleted. Requiring industry to comply with the proposed monitoring guidelines is very difficult with the previous three variables not under our control. The proposed process would be time consuming, expensive, and excessive when reclamation could be handled in a much simpler manner. After two years, an onsite inspection of the site could determine if additional work is necessary. If it is needed, industry typically has been receptive to doing that work.

**SUMMARY**

Marathon recommends that the BLM carefully consider our proposals. While this draft document represents one of the more comprehensive EIS's that I have seen, some improvements are needed. Rather than repeat other comments, we also generally support comments from the Petroleum Association of Wyoming and J. R. Ruddy of Amoco. We are willing to provide additional information, if necessary. Should you have any questions concerning this letter, please let me know.

Sincerely,

MARATHON OIL COMPANY

*Pat Childers / by R.M. Moseley*

Pat Childers  
 Government Affairs Coordinator  
 Rocky Mountain Region

CPC:dle (3151-12)

Enclosures

xc: PAW-Kathy Springer w/o enclosures  
 RMOGA-Claire Moseley w/o enclosures

Comment Letter #11

PETROLEUM ASSOCIATION OF WYOMING

a division of Rocky Mountain Oil and Gas Association



951 Werner Court, Suite 100  
 Casper, Wyoming 82601  
 (307) 234-5333  
 fax (307) 266-2189

Richard T. Robitaille  
 Executive Director

Thomas H. Clayson  
 Associate Director

Cathy Schulte  
 Office Manager

Katherine G. Springer  
 Associate Director

June 15, 1995

Bureau of Land Management  
 Bill McMahan, Project Coordinator  
 P O Box 1869  
 Rock Springs, Wyoming 82902-1869

Dear Bill:

Below are comments of the Petroleum Association of Wyoming (PAW), a division of the Rocky Mountain Oil and Gas Association with respect to the Expanded Moxa Arch Area Natural Gas Development Project Draft Environmental Impact Statement (DEIS). PAW, a division of the Rocky Mountain Oil and Gas Association (RMOGA), represents a membership which accounts for over 90% of the oil and gas exploration, production and transportation in the state of Wyoming.

In general, the DEIS appears to be one of the most comprehensive BLM documents produced-to-date. Certainly southwestern Wyoming has gained national attention as the fourth ranked basin for its proved natural gas reserves of nearly 11 trillion Mcf.\* PAW applauds BLM for moving in a proactive manner to responsibly develop Wyoming's natural gas resources. However, we call to the attention of BLM the following areas for clarification, comment and concern:

11-1

Page S-2 under S.1.1 Proposed Action

The 2nd paragraph describes the total area of disturbance with an estimated 20,293 acres of short term disturbance and 5,691 acres of long term disturbance. That equates to more than 15 acres for the initial production phase and 4.3 acres for long term area of disturbance. Granted, each field under analysis may be different in nature; however, average areas of disturbance figures used for other BLM EISs, per the Wyoming BLM state office, appear to be approximately 2 acres for short term and less for long term disturbance. Please recheck these figures and amend the document, as appropriate, to accurately reflect the current situation.

11-2

Page 2-5, 2.2.1 Preconstruction Planning and Site Layout

The last sentence of the first bullet states a "detailed

\* US Energy Information Administration following the on-site



951 Werner Court, Suite 100  
 Casper, Wyoming 82601

Moxa Arch Comments  
 Page 2  
 June 15, 1995

11-2  
 Cont.

engineering design..." will be submitted with the application evaluation. A recent streamlining meeting between BLM and industry on February 7/8, 1995, it was decided and agreed to by the state director, "to eliminate the arbitrary 300 feet requirement and to empower the resource area ES/NRS with determination." It was also recommended the "300 feet requirement was only intended to be a guide and that BLM could remove the requirement having the ES/NRS make the determination in the field based on the road criteria needs." We recommend this policy replace the "requirement" contained in the DEIS.

11-3

Page 2-12 2.2.2.2 Access Road Construction

(2nd column, 3rd paragraph) - As discussed in the February 7, 8, 1995 BLM/industry meeting on roads and reclamation, a recommendation was made to implement a royalty free gravel policy. Understanding the issue will be taken to the Solicitor General, PAW would appreciate due consideration of this recommendation for the DEIS.

Additionally, graveling may, in some instances, be unnecessary; therefore, we would recommend amending the DEIS to read "Roads would be designed to minimize disturbance and would be built, graveled, and maintained as agreed to by BLM and the operator at the time of the on-site evaluation."

11-4

Page 2-14 (1st column, 2nd paragraph)

Suggested 3rd sentence word change: When necessary. Reconnect roads to producing well sites would be graveled within one year following successful drilling, or within one year from when the well goes to production.

11-5

Page 2-33, 2.2.4.1 Preconstruction Planning and Design Measures

In subsection 2, while it is implied the planning document covers only federally-managed lands, acknowledgment of the lead operator responsible for administration of a road maintenance agreement should be stated. We suggest the following language: "While all parties operating in a given area are responsible for road maintenance, the lead operator (the operator with the greatest number of federal wells) in an area will be responsible for administration of the formal or verbal road maintenance agreements."



COMMENT LETTERS RECEIVED ON THE DRAFT EIS



951 Werner Court, Suite 100  
Casper, Wyoming 82601

Moxa Arch Comments  
Page 3  
June 15, 1995

Page 2-33 2.2.4.2.3 Transportation

11-6

PAW supports the comments submitted by Amoco Production Company in that it is "unrealistic to expect that there can actually be a usable, specific transportation and road network plan for all of industry for the next 5 to 10 years." We also agree, that like the US Forest Service when it proposes a timber sale, a transportation plan is developed at USFS expense, the same should apply for BLM. However, industry acknowledges that a transportation plan for a timber sale and oil and gas development field can be different. Therefore, it may be appropriate to amend the language allowing for the primary operator(s) of each field within Moxa Arch to submit and implement their own transportation plan and maintenance agreement.

Page 2-34 2.2.4.2.4 Minerals/Paleontology

11-7

There appears to be inconsistencies over the degree of surveys in the document. For example, the 1st column, 2nd paragraph reads "areas of high paleontological potential will be surveyed by a qualified paleontologist on a project-by-project basis to identify and quantify the presence or potential presence of significant paleontological resources." Exhibit 3-2, page 3-9 shows the Bridger Fm and Green River Fm as areas of "high paleo potential" which means the entire Moxa Arch should be surveyed. However, on page 4-15, 1st column last paragraph, the prescribed treatment of paleontological resources calls for "a survey may be required, depending on the extent of the proposed disturbance and the proximity of known paleontological sites." Again on page 4-18, 1st column under Specific Measures- Class III Field Survey the text contradicts page 4-15.

BLM recently revised its Programmatic Agreement (PA) for cultural resources in the state, an agreement that will be used as a nationwide pilot project. The PA acknowledged the extensive data base of cultural inventories in Wyoming and sought to streamline BLM's workload, relieve the State Historic Preservation Office of unnecessarily micromanaging the 106 process, and to identify high site density areas rather than "surveying the world." This requirement appears to negate much of the collaborative efforts achieved to date; therefore, PAW is opposed to requiring a qualified paleontologist to survey all projects within the Moxa Arch area.

Page 2-36 2.2.4.2.8 Vegetation and Wetlands

11-8

(#5) PAW understands an extensive vegetation technical report was submitted with the DEIS. Therefore, we believe BLM should take the responsibility for follow up work rather than expecting industry to



951 Werner Court, Suite 100  
Casper, Wyoming 82601

Moxa Arch Comments  
Page 4  
June 15, 1995

11-8  
Cont.

fund a consulting botanist to do these surveys. The DEIS should be changed to read: "At the time of the onsite, the BLM will conduct a site-specific survey..."

Page 2-37 2.2.4.2.9 Wildlife

11-9

Subsection (10) The document does not appear to provide scientific data to support a two mile radius restricted area nor an extended breeding, egg-laying and incubation period. Therefore, we suggest the following word change "Provide for sage grouse lek protection during the breeding, egg-laying and incubation period (normally March through mid June 15 through May 31) by restricting construction activities within a two mile radius one-quarter mile of active sage grouse leks."

Page 4-14 4.3.6 Mitigation Summary

1st paragraph - See PAW's comments on page 3 referring to: Page 2-33 2.2.4.2.3 Transportation

Page 4-66 4.9.6.2 Sage Grouse

11-10

"To avoid the possibility of displacing sage grouse from nesting habitats, construction activities within a two-mile radius of active leks would be limited to the period extending from June 15 through March 1" and "no activity would be allowed within 0.25-mile of an active sage grouse lek from March 15 through May 31." However, in Appendix A, 2.0 Wildlife Mitigation Guideline (b) raptors and sage and sharp-tailed grouse have been coupled and it states "To protect important raptor and/or sage and sharp-tailed grouse nesting habitat, activities or surface use will not be allowed from February 1 to July 31 within certain areas encompassed by the authorization. The same criteria applies to defined raptor and game bird winter concentration areas from November 15 to April 30." Obviously, these time frames are in conflict. It is inappropriate to consider grouse and raptors together.

Secondly, the last sentence requires Moxa operators, in "coordination with BLM and WGF, develop a habitat enhancement plan that would mitigate the sage grouse nesting habitats that would be eliminated by construction and operation of production wells." The need for a plan has not been demonstrated in this document. Industry has funded numerous "plans" and "programs" and should not be required to fund "research projects." We suggest deleting this requirement.



951 Werner Court, Suite 100  
Casper, Wyoming 82601

Moxa Arch Comments  
Page 5  
June 15, 1995

Page 4-66 4.9.6.4 Big Game

11-11

2nd column, 1st full paragraph - The document is unclear where the "9.45 acre" is derived. It appears to be inconsistent with other sections of the DEIS referencing impacts to antelope crucial winter range. Please clarify and change where appropriate.

4.9.6.5 Data Collection

11-12

The first and second paragraphs suggest BLM instructed the consultant to proceed with the surveys even though the timing was inappropriate for adequate assessment. Communication before hand could have saved industry and BLM time and dollars, now it appears the BLM or the operator will be required to redo the survey which may include aerial surveys. PAW understands industry has already paid for this effort and should not be required to carry out maintenance and follow up work.

Page 4-83 4.11.6 Mitigation Summary

11-13

2nd bullet - "Restrict drilling on all Class III areas visible from the locations noted above to two drill sites per square mile." This could be highly restrictive to industry and not allow for flexibility on a site-by-site basis. Certainly there are alternatives which could protect the visual resources using appropriate colors for equipment, low profile tanks, etc. We support changing the bulleted items to read: "Restrict drilling on all Class III areas visible from the locations noted above to two drill sites per square mile. Where drilling prohibitions are determined by BLM and the operator to be unfeasible, employ visual resource protection measures such as appropriate colors for equipment, low profile tanks and other methods mutually acceptable by BLM and the operator."

Page 5-1 5.1 Mitigation

11-14

2nd column, 3rd paragraph - Industry funded a technical report conducted by Western Wyoming College synthesizing the data for Moxa Arch and identifying among other things, the high site density areas which eliminate the need for "surveying the world." This paragraph doesn't specifically identify industry's additional responsibilities for Class III inventories as a result of the recently agreed to Programmatic Agreement and Western Wyoming College report. Industry should not be required to fund maintenance and follow up work.



951 Werner Court, Suite 100  
Casper, Wyoming 82601

Moxa Arch Comments  
Page 6  
June 15, 1995

Page 5-3 5.2.6 Wildlife

11-15

We suggest deleting this measure because BLM has not clearly demonstrated the need for additional mitigation. This measure also leaves industry with numerous questions such as: 1) what kinds of additional opportunities would industry be offered to mitigate habitat loss?, 2) what would the "monitoring raptor nesting and sage grouse lek use" involve?, 3) how far removed from the actual project does "adjacent to the Moxa development" mean? A BLM Instruction Memorandum WY-93-160 dated 7-7-93 cites an opinion by the Solicitor General that he does not believe offsite mitigation is appropriate and views it as an authorized tax, among other things. Therefore, PAW opposes offsite mitigation language in any NEPA document that conflicts with BLM's IM WY-193-160.

Appendix B - Reclamation Guidelines

Page B-21 4.4.2 Seed Application

11-16

1st full paragraph - In reference to the "AO determining the appropriate seed mixture to apply", industry believes the BLM should "recommend" and not "determine" seed mixtures. BLM does not have the authority to order a seed mixture to be applied to private lands.

4.4.3 Mulching

11-17

Mulching may be an option in difficult areas to reclaim; however, operators have had little or no success with mulching. Operators having discussion with seeders find "they do not recommend mulching as it increases the seeding costs while providing little or no benefit."

Page B-23 4.5 Monitoring and Maintenance

11-18

While the degree of monitoring may be desirable, PAW believes it is excessive. It would require an employee dedicated strictly to monitoring reclamation projects to achieve this standard. The rule of reasonableness should be acknowledged in this section and amended as appropriate.

Page B-24 4.5.4 Photomonitoring

11-19

This requirement is overkill. BLM has not clearly demonstrated the need for this requirement; whereas, annual inspections should be sufficient.





951 Werner Court, Suite 100  
Casper, Wyoming 82601

Moxa Arch Comments  
Page 7  
June 15, 1995

Appendix C Hazardous Substances Management Plan:

Page C-2 Condensates

11-20 Federal regulations under 40 CFR Part 112.7 state that a berm which contains 100 percent of the entire storage capacity of the largest tank is required. This section requires 125 percent. The EIS should conform to existing regulations.

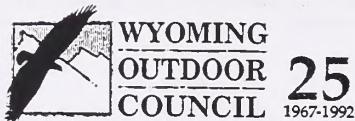
PAW appreciates the opportunity to comment on the Expanded Moxa Arch Area Natural Gas Development Project Draft Environmental Impact Statement. History in this area has proven extraction of natural resources can be accomplished in an environmentally sound manner for the good of Wyoming, its residents and its wildlife. The petroleum industry looks forward to maintaining its long standing partnership with the BLM in southwest Wyoming and the state of Wyoming.

Sincerely,

*Kathy Springer*

Kathy Springer

- cc: John Kauchich, PAW President  
Mike Mueller, PAW Vice President  
Dave Petrie, UPRC  
Terry Nimmo, Wexpro Company  
Jan Rutty, Amoco Production Company  
Robert Johnson, Bannon Energy  
Pat Childers, Marathon Oil Company  
Ken Tholstrom, Presidio Oil Company  
Claire Moseley, RMOGA



Comment Letter #12

VIA FAX to (307) 362-6001 and CERTIFIED MAIL, RETURN RECEIPT REQUESTED

June 16, 1995

Mr. Bill McMahan  
Project Coordinator  
Bureau of Land Management  
Rock Springs District Office  
P. O. Box 1869  
Rock Springs, Wyoming 82902-1869

Re: Expanded Moxa Arch Area Natural Gas Development Project Draft EIS

Dear Mr. McMahan:

Thank you for granting my request for a short (5-day) extension of time to submit comments on the Expanded Moxa Arch Area Natural Gas Development Project Draft EIS. The following comments are submitted on behalf of the Wyoming Outdoor Council, Sierra Club, Greater Yellowstone Coalition, and Friends of the Bow/Biodiversity Associates (hereinafter "conservation groups"). Again, we appreciate having an extra few days to submit these comments.

Description of Proposal and Alternatives

The BLM proposes to authorize the Moxa Arch operators to infill drill and develop approximately 1,325 natural gas wells and associated pipelines, roads, and production facilities over a 10 year period on 476,261 acres of federal, state, and private lands in Lincoln, Uinta, and Sweetwaters counties, Wyoming. Under the proposed action, 610 wells would be located within the field's proven production area, spaced at an average of four wells per section, while 715 wells would be developed in the "flank" areas, where production exists but reserves are not proven, at an average well density of two wells per section. Under the most aggressive scenario, as many as four wells per section could be developed in the flank areas during a ten year period. Although higher well densities in the production areas are not anticipated, the EIS notes that "some areas with below-average recovery of gas reserves may justify well densities of five to eight wells per section." EIS at 2-1. 795 miles of new roads and 1,458 miles of new pipelines (each with a 50' right-of-way) would be required under the proposed action.

Presently, 957 wells are producing natural gas in Moxa Arch analysis area, and another 162 wells have been abandoned and plugged. Implementation of the proposed action, which is also the BLM's "preferred alternative," would directly impact (excavate)

25 years of Wyoming Conservation Action

201 Main Lander, Wyoming 82520 (307) 332-7031

20,293 acres of land, approximately 4.3 percent of the 476,261 acre analysis area. Existing disturbance in the Moxa Arch analysis area from the construction of wells, pipelines, roads, and ancillary facilities has already impacted nearly 26,000 acres, or 5.5 percent of the analysis area.

The EIS describes two alternatives to the proposed action described above: a "no action" alternative that would prohibit further development in the Moxa Arch Area, and a "minimum development scenario" alternative (Alternative "A") authorizing the development of 795 wells and associated facilities within the Moxa Arch analysis area in addition to existing operations. Under this alternative, 610 wells would be developed in the proven production area, and 185 wells would be developed in the flank areas.

Introduction

Our chief concern with this document is that it fails to provide an accurate and honest analysis of the direct, indirect, and cumulative impacts of energy development in southwest Wyoming. We have talked ourselves blue over this issue, and it is apparent from this document that our concerns have fallen on deaf ears. The most conspicuous shortcoming of this EIS is its failure to analyze (indeed, even mention) a very large proposed natural gas development project immediately north of the Expanded Moxa Arch Area, the Fontenelle Infill Project EIS, its dismissal of the No Action alternative and related failure to consider a reasonable range of alternatives, its narrow scope and failure to adequately consider cumulative impacts, particularly those occurring on a region-wide scale, and its tendency to whitewash and gloss over many negative environmental impacts. On the positive side, the EIS is well written and well organized.

12-1

Our specific comments follow. Please call us if you have questions or need clarification of any of the following.

Scope of Analysis Inadequate

NEPA regulations require agencies to "make sure the proposal which is the subject of an environmental impact statement is properly defined. Agencies shall use the criteria for scope (§ 1508.25) to determine which proposals shall be the subject of a particular statement. Proposals or parts of proposals which are related to each other closely enough to be, in effect, a single course of action shall be evaluated in a single environmental impact statement." 40 CFR § 1502.4(a). For years, the BLM has been deliberately ignoring this critical requirement in order to avoid having to prepare a region-wide or programmatic EIS for energy development in southwest Wyoming.

12-2

Under the identified criteria, the Moxa Arch EIS is clearly deficient for failing to consider other energy and mineral development projects and proposals in southwest Wyoming. The BLM is well-aware of the projects and proposals under review, so there is no need to list them here. Some of the existing development to which we refer is listed in Exhibit 3-3. We find it astonishing that this EIS fails even to mention, much less

2

12-2  
Cont.

analyze, the Fontenelle Infill Drilling Proposal EIS, which describes the effects of a proposal for approximately 1,317 new gas wells in an area immediately north of the Moxa Arch area. Because it fails to both consider and analyze the effects of the Fontenelle Infill Drilling proposal, the Expanded Moxa Arch Area EIS does not satisfy the basic requirements of NEPA. At a minimum, the two projects must be analyzed together in a single EIS.

Other Projects and Proposals Must be Identified in the Expanded Moxa Arch Area EIS

When preparing environmental documents under NEPA, agencies are required to "[i]ndicate any public environmental assessments and other environmental impact statements which are or will be prepared that are related to but are not a part of the scope of the impact statement under consideration." 40 CFR § 1501.7(a)(5). The BLM is aware of literally dozens of related EAs and EISs for energy and mineral development projects in southwest Wyoming, yet none are mentioned in the Moxa EIS. Why not? Our major complaint about BLM energy development EAs and EISs is their piece meal approach to analyzing environmental impacts. This provision is intended to assist agencies understand and address cumulative impacts caused by their actions, and it is therefore greatly disappointing for us to see BLM continue to ignore the cumulative effects of energy development in SW Wyoming, particularly when BLM itself has identified regional impacts as a major concern.

12-3

Environmental Analysis Process Flawed

The Moxa EIS fails to achieve its stated purpose of "provid[ing] the decisionmakers with information needed to make a final decision that is fully informed and based on factors relevant to the proposal." DEIS at 1-10, § 1.3. When an EIS for a major federal action all but ignores the major environmental concern expressed by both the public and the agency; i.e., the cumulative region wide effects of oil and gas development in southwest Wyoming, it is impossible for it to have achieved the goal of informed agency decisionmaking. Thus, contrary to the claim in the EIS (§ 1.4), the analysis fails to use an "accepted process" for evaluating and disclosing the potential environmental consequences of the proposed action and alternatives. An "accepted process" must clearly also be a legal process, and this EIS is plainly not in conformance with NEPA. In any case, please explain what is meant by an "accepted process." The term is not defined in the CEQ's NEPA regulations or in any BLM regulation or manual we are familiar with. NEPA requires you to provide this information. 40 CFR § 1502.24.

12-4

The EIS indicates that the Moxa Arch analysis area encompasses approximately 476,261 acres of federal, state, and private land, but does not explain why or how that particular area was identified. The EIS should explain the rationale behind identifying the Moxa Arch Analysis Area. What factors led to its designation? It appears to us the decision was based largely, if not solely, on jurisdictional boundaries and a desire to artificially limit the scope of the analysis. Specifically, why wasn't the Fontenelle Infill

3



12-4 Cont. Project included within the Moxa analysis area when a reasonable reading of NEPA and understanding of its purposes suggests that it should have been?

Need for Programmatic EIS

In *Kleppe v. Sierra Club*, 427 U. S. 390, 409-410 (1976), the United States Supreme Court stated that

[NEPA] § 102(2)(C) may require a comprehensive impact statement in certain situations where several proposed actions are pending at the same time. \* \* \* A comprehensive impact statement may be necessary in some cases to meet [NEPA's requirements]. Thus, when several proposals for coal-related actions that will have cumulative or synergistic environmental impact upon a region are pending concurrently before an agency, their environmental consequences must be considered together.

12-5 In view of the extensive energy development occurring and planned in southwest Wyoming, much of it in the immediate vicinity of the Moxa Arch Project, we believe the only way the Moxa Arch EIS can satisfy the requirements of NEPA is by tying it to a broader programmatic or region wide EIS. Obviously, given the lack of such a document, that scenario is, in the short term, impossible.

We have included for your information our earlier letter to Interior Secretary Bruce Babbitt which explains in detail our concerns relative to this issue. Please consider the points raised in the letter; they have a direct bearing on the Moxa Arch Project and other natural gas development projects planned for Wyoming. We are confident you will agree that the need for a programmatic EIS describing the regional environmental effects of energy developments in SW Wyoming is acute.

Need to Consider Connected and Cumulative Actions

The EIS needs to consider the full range of impacts from connected and cumulative actions. 40 CFR § 1508.25. By this we mean, for example, the impacts from additional excavations from (and travel to and from) gravel pits that are needed to supply material for road construction. See DEIS at 2-14. Where are these pits located? How much material will be removed? How will activities associated with supplying gravel affect the resources identified in the EIS. Pit locations should have been provided in the DEIS, not deferred as noted on page 2-33. Indeed, the large number of environmental reviews and studies that have been deferred make meaningful review of this document difficult, if not possible.

12-6 Will new gas processing facilities be required to process the additional production? If so, what are the impacts?

What is the area's natural gas "take away capacity" and is it sufficient to handle the new production, or will new transportation systems be required? Will the gas

produced by the proposed action be shipped on the Kern River pipeline, which is near capacity, or on some other line. The EIS should describe the new Opal (natural gas) Market Center, and other marketing centers, that have developed as a result of increasing gas development in SW Wyoming, and the impact the center's operation is having on the human environment.

12-6 Cont. The EIS indicates that hazardous waste will be taken from the site and disposed of at approved disposal facilities. This is a classic "connected action." Where are these sites? How much waste will be generated and taken to the sites?

The EIS states (§ 2.2.3.5) that additional geophysical operations will occur in the Moxa Arch analysis area for several more years, yet the impacts from this activity do not appear to be addressed in the EIS. Please describe the techniques to be used and any environmental consequences anticipated.

Environmental Consequences Not Adequately Analyzed

Multiple Use Impacts Generally

The DEIS fails to discuss how this project, combined with existing and proposed energy development in the Region, may affect or impair opportunities for "multiple use." Under the Federal Land Management Policy Act (FLPMA) BLM has a legal obligation to provide for sustained yield and multiple use of land and renewable resources. Intensive energy development in many areas in southwest Wyoming has already limited the BLM's ability to provide for multiple use (e.g., wildlife habitat, clean air and water, aesthetic enjoyment, range of recreation opportunities, including quiet solitude) and we feel it is incumbent upon BLM to give this issue some serious and thoughtful consideration. Over the next two decades, energy development in southwest Wyoming could directly impact one million acres (DEIS at 4-86, § 4.13.4), and cause indirect and secondary impacts to a much larger area. No document or plan we have seen authorizes the conversion of southwest Wyoming to an industrial landscape, yet that is exactly what appears to be happening. If southwest Wyoming is going to become the Nation's "sacrifice area" in the interest of satisfying the country's increasing energy demands, the public deserves to be informed of this and invited into the debate. There is no better time than now to begin a national conversation on this issue. Perhaps massive development of southwest Wyoming is in the public's best interest, but if it occurs, there are going to be costs. This information has heretofore not been provided to the public, and it is time for this to occur.

Recreation

On page 3-73, the DEIS notes that "[o]verall recreation use levels are generally low to moderate because of . . . the presence of more attractive recreation alternatives in the region." We suspect the reason the project area is viewed as unattractive or less attractive by some segments of the public is because of the past effects of oil and gas development. Clearly, the area is not inherently unattractive, in fact the opposite is

12-8

probably true. The "more attractive recreation alternatives in the region" referenced in the EIS are doubtless those areas that have not been as heavily impacted by energy development activities. This section of the EIS should acknowledge that oil and gas development has impacted recreation opportunities in the Moxa Arch area and has caused the displacement of recreational users seeking solitude and privacy, and an aesthetically pleasing environment.

12-8 Cont.

The EIS (page 4-85, § 4.13.2.1) notes that the action could cause "temporary displacement of some hunters" but then admits that "there could be a deterioration in the quality of the recreational experience throughout the year 2005." Do you consider a 10 year impact "temporary"?

Socioeconomic Impacts

We don't agree with the EIS's analysis of socio-economic impacts. Unfortunately, as is customary with BLM-supervised EISs for energy development projects in southwest Wyoming, this EIS attempts to discount any potential negative socio-economic effects that might result from the proposed action. For example, the EIS (p. 4-94) indicates that although the oil and gas drilling and field service industry "has been growing for the past four or five years in response to increasing natural gas well field development activity in southwestern Wyoming," it concludes that "the existing industry would be able to accommodate the Proposed Action. . . ." We don't see how both can be true. By any measure, 1,325 new wells is a substantial development. Combined with other proposals (e.g. Fontenelle Infill Development Project), thousands of new wells will be developed during the next decade. If, as the EIS states, "no in-migrant population is expected to result from the Proposed Action," when will such growth occur? Are you suggesting that no further population increase in southwest Wyoming is anticipated from future energy development? Why would energy development cause growth for 4 or 5 years "in response to increasing natural gas well field development activity in southwestern Wyoming" and then with respect to this development project not cause additional growth? Your conclusion about no growth is illogical and further explanation is needed to support your position.

12-9

The EIS fails to discuss the economic benefits of tourism and big game license receipts derived from activities in the Moxa Arch area, and how the proposal may affect these economically-important activities. As noted in the EIS, this area contains regionally-important recreation resources: Fontenelle Reservoir, Seedskadee NWR, and the Green River, and provides "excellent pronghorn hunting opportunities." DEIS at 3-73. While it may be the most important, oil and gas is not the only economic activity occurring in the counties affected by the proposed action. The "description of the affected environment" section of the EIS needs to be amended to provide a more detailed analysis of recreation income. The EIS should also provide a more thorough analysis of direct and cumulative impacts to recreation and tourism activities caused by the action. We disagree that the project will "create primarily positive socioeconomic impacts." DEIS at 4-86. With respect to tourism, recreation and hunting receipts, we are confident that the effects will primarily be negative.

Geologic Hazards

The EIS indicates on page 3-7 (§ 3.4.1.) that "[s]eismic activity is low in the area." We assume this statement was written prior to the roof collapse at an underground trona mine in the vicinity of the Moxa Arch area, which was triggered by (or caused) a seismic event of 5.1 on the Richter Scale. Much new information on seismic risks in this area has been developed since the mine disaster. To the extent it is relevant, this new information should be included in the EIS.

12-10

The EIS is silent with respect to the potential risks posed by the project to public health and safety and the environment in the event of a significant seismic event. With all that natural gas at the surface in pipelines and processing facilities, what would happen if a seismic event (natural or man-induced) caused a rupture of a pipeline and ignition followed? What plans, if any, are in effect to deal with such a scenario?

Paleontological Resources

The EIS (§ 4.4.5) concludes that "[n]o cumulative impacts to geologic or fossil resources are anticipated from implementation of the Proposed Alternative or Alternative A if mitigation measures described below are implemented." This statement is incredible. Cumulatively, over one million acres in SW Wyoming will be excavated as a direct result of natural gas development projects like Moxa Arch. Additional areas have been and will continue to be impacted by other development activities, such as trona, coal, and uranium mining, grazing, road construction, etc. Thousands of new miles of new roads and pipelines will be constructed to support this development, many of them in presently undeveloped areas. Given this, we find it astonishing that the EIS can make this conclusion.

12-11

The mitigation measures proposed (§ 4.4.6) to address the impacts to fossil resources certainly will not achieve the level of success you claim. Class I and Class III surveys should be done immediately, and areas with high paleontologic potential and areas that are believed most likely to contain significant fossil resources should be off limits to surface occupancy. Fossil scavenging by workers and the general public has already significantly impacted Wyoming's world class fossil resources. New development and thousands of miles of new roads can only make matters worse.

Visual Impacts

The discussion of the importance of visual resources in the Moxa Area (page 3-69, § 3.11.2) to recreationists and others who use the area is thoughtful and honest. Visual resources are important to us here in Wyoming, and the natural landscape and unobstructed panoramas common in Wyoming are truly unique experiences found in very few other locations. Many consider Wyoming's open spaces and big skies to be among the state's most important resources.

12-12



The EIS correctly notes (§ 3.11.1) that "[s]ightlines are long and the visual absorption capacity is low" in the Moxa area. Thirty square miles of the Moxa Analysis Area is considered visually sensitive, and has been designated accordingly as Class II VRM.

The EIS states (p. 4-81, § 4.11.2.1) that "standard stipulations for oil and gas leases indicate that surface disturbance would be prohibited 1) within important scenic areas (Class I and II VRM areas) and 2) within a quarter mile or visual horizon [whichever is closer] from a historic trail." But then the EIS goes on to suggest that drilling could in fact occur in these areas: "Drilling site locations . . . in the Class II and III zone would affect the greatest number of viewers." Id. at § 4.11.2.2. And again: "Impacts associate with any well site development in Class II areas would be considered significant unless they were screened from view." DEIS at 4-83, § 4.11.4. If stipulations prohibit development in Class I and II areas, why is the EIS discussing impacts that may occur from development in Class II areas? The same suggestion (that drilling is to occur in Class II areas) is made again on page 4-82 in the discussion of mitigation.

Our view on this issue is simple: If the standard stipulation for oil and gas leases prohibits development in Class I and II VRM areas and within a quarter mile or visual horizon (whichever is closer) from a historic trail, than that activity is prohibited. Period. No amount of natural colored paint or other "mitigation" can disguise the visual impacts of oil and gas development in sensitive areas, computer models notwithstanding. Further, additional infill development in Class III areas should be done from existing well pads to minimize visual impacts.

The EIS states in the summary of recommended mitigation (§ 4.11.6) that drilling locations in Class II areas should be prohibited "where feasible." What exactly does this mean? And who decides what is or is not feasible? Since BLM retains complete authority to deny additional development on producing leases, what scenario could arise that would make it infeasible for BLM to prohibit further development in Class II VRM areas?

Noise Impacts

This issue is given inadequate consideration in the EIS. Noise from drilling and production operations can ruin an outdoor experience, particularly when the objective or desire of the user is privacy and quite solitude, such as a bow hunter or person seeking "spiritual" enlightenment. Compressors, especially, emit a kind of noise that carries for miles, well beyond the distances considered in the EIS in § 4.12.3.1. The constant "thumping" low frequency noise emitted by compressors carries (depending on local conditions, time of day, etc.) for miles into areas that are managed to provide natural experiences, such as Class II VRM areas, wilderness study areas, and within the Seedskaadee NWR, on Fontenelle Reservoir, and within the Green River and Hams Fork river corridors. This needs to be recognized in the EIS.

While, as the EIS notes (§ 4.12.2), there may be "no specific resource management directions presented in the Kemmerer RMP for this resource discipline," the BLM nonetheless must under FLPMA provide for a range of multiple-uses, which includes opportunities for quite solitude, and secure areas for wildlife. We seriously question the BLM's ability to provide for these uses if this project is authorized in its current configuration.

The EIS does not indicate how many new compressors will be required, nor does it analyze this particular type of noise, which, because of its incessant nature, many find to be more offensive than louder, but more irregular and ephemeral, noises such as heavy equipment and trucks. What type of and how many compressors are going to be used? What is their decibel level? Where will the compressors be located? Over what distance will the noise carry? These questions must be answered in order to have a complete understanding of the impacts from noise caused by the proposed action. The EIS needs to consider alternatives that would reduce noise related impacts, like reducing the number of compressors, placement in industrialized areas, or requiring more effective noise mufflers.

We do not agree with the EIS's conclusions regarding noise impacts (page 4-84), nor do we find the level and scope of analysis adequate. The EIS concludes (§ 4.12.5) that because of the "dispersed nature of gas production operations within the Moxa analysis area, . . . project-related noise would not be significant." First, four (and perhaps as many as eight) wells per section is anything but dispersed. If noise from development and production operations can carry for thousands of feet at a level of 55 dBA or greater, than there will be no opportunity anywhere in the Moxa arch area one can go to escape the noise. We consider this a significant impact, even if the noise is below 55 dBA. Second, the EIS's analysis focuses primarily on noise impacts to workers, residences, and human safety. What about impacts to noise sensitive wildlife that will be displaced from the area (increasing, because of extensive energy development, they have nowhere else to "displace" to), and to recreationists who use the area. Third, the methodology used to analyze this issue is inappropriate. Why was a level of 55 decibels chosen to represent a threshold of significance? This level of noise can seriously detract from visitor experiences. Thus, we disagree with the EIS's conclusion (§ 4.12.7) that "[i]mplementation of mitigation measures as proposed should fully mitigate or reduce all noise impacts to levels not considered significant."

Many people travel to Wyoming's remote areas to escape the pressures, sounds, and signs of every day urban life, and value greatly having the opportunity to do so. Southwestern Wyoming used to be the one place in Wyoming where one could virtually be assured of finding complete quiet and solitude. Unfortunately, this is no longer the case. We think it is time for the BLM to recognize this fact, and to advise the public that these opportunities will no longer be as plentiful as they once were. The inexorable loss of open space and opportunities for peace and quiet is just one of the many costs of the industrialization of SW Wyoming that needs to be publicly acknowledged.

Soils and Reclamation

The EIS notes (at 2-41) that almost 26,000 acres in the Moxa area have already been disturbed by gas development and other industrial and transportation activities. Some of this disturbed area has been "reclaimed." The EIS fails to indicate, though, what level of reclamation has been obtained. Reclamation potential in much of the Moxa area is poor (31% of the analysis area contains "sensitive soils"), and one would suspect that reclamation success varies greatly. The success of reclamation in these areas should be quantified. For example, how much of the "reclaimed" area now supports a native plant community and provides the functions and values that existed prior to disturbance?

The EIS should discuss the length of time required for native shrubs and other species to reestablish and should consider this factor in the analysis.

The BLM's failure to include the transportation plan in the EIS severely hampers the public's ability to comment meaningfully on this important aspect of the project. Without the plan, exactly what are we supposed to be reviewing and commenting on? What is the specific proposal?

The EIS notes (p. 4-20) that avoidance of sensitive soils would not be possible because they exist over such a large area. There is no reason why an alternative couldn't be tailored to avoid most, if not all, impacts to sensitive soils. In BLM's view, why isn't it possible to avoid sensitive soils? Unfortunately, because road, well, and pipeline locations have not been disclosed in the EIS, analysis of cumulative and site specific impacts is impossible. Waiting to the APD stage to generate this information results in further piecemeal environmental analysis and obfuscation of environmental consequences.

The EIS recommends (at p. 4-20) that badlands and steep slopes should be avoided "due to high erosion rates and very poor reclamation potential," but then notes that avoidance may not be possible. Again, we ask why avoidance is not "feasible." With the appropriate information, the conservation groups could design an alternative that avoids these features yet still allows a reasonable level of gas development. The public deserves an opportunity to review a specific proposal to develop gas reserves in the Moxa area.

BLM has developed cumulative impact significance criteria for this project without providing any rationale, other than that it is based on "professional experience." Under the criteria, the cumulative level of soil disturbance that calls for a finding of significance is 10 percent. Conveniently, the proposed action, when combined with existing disturbance, results in disturbance to 9.7 percent of the analysis area, which of course is insignificant under the chosen criteria. Perhaps the EIS should discuss what factors BLM considered in developing this criteria?

The cumulative impacts analysis (§ 4.5.5) of soils impacts fails to consider proposed and reasonably foreseeable future actions within the two million-acre "Cumulative Impacts Analysis Area." EIS Exhibit 3-3 shows extensive mineral development activity in the Moxa Analysis Area, much of it within the CIAA identified on page 4-26, Exhibit 4-3. We know of a number of energy and mineral development proposals in this area. The disturbance likely to be caused by these future actions must be taken into account in any cumulative effects evaluation.

We suggest you contact the Wasatch National Forest for a list of proposals on that forest.

The EIS also fails to consider disturbance in the CIAA due to livestock grazing and commercial logging.

Cultural resources

The EIS states at 3-79 that "2,871 prehistoric sites/components and 237 historic sites/components are present in the analysis area." (emphasis added). To the contrary, 2,871 sites have been recorded in the analysis area. Because much of the Moxa Arch analysis area has not been subject to a Class III cultural resource inventory, and because prehistoric and historic site density is high in the Moxa analysis area, it is likely that a far greater number of sites exist in the area than those presently reported.

Although we are concerned about the project's impacts to cultural resources generally, we are particularly concerned about impacts to historic trails and Native American religious sites. The EIS notes that several significant historic trails exist within the Moxa area (at p. 3-82), but fails to describe the existing condition of those trails and how past and ongoing development has affected the integrity of those resources. This baseline information is needed so that an accurate and complete analysis of potential direct, indirect, and cumulative effects of the proposed action can be made.

Trail segments that exist in pristine condition should be avoided at all costs. If crossing are required, they should occur only in areas that have been disturbed, such as designated corridors and existing rights-of-way.

Management of historic trails on BLM-administered public lands is guided by historic trail management plans. The EIS should evaluate the proposed action for consistency with the applicable plans.

The EIS should describe the actions it took to consult with Native Americans. See DEIS at 4-95. Amendments to the National Historic Preservation Act require certain steps to ensure adequate consultation. No response from the Tribes suggests that additional efforts may be necessary to elicit their involvement.

12-12  
Cont.

12-13

12-14

12-14  
Cont.

12-15

12-13  
Cont.

(a)

(b)

(c)

(d)

(e)



12-15

Cont.

- (f) The significance of the single rock art site in the Moxa area should be described. See DEIS at 3-81. Is the site listed or eligible for listing on the National Register? What steps has BLM taken and what actions are being proposed to preserve this site?
- (g) Due to the lack of information in the EIS, particularly location and significance of cultural sites, Class III inventory data, road, and pipeline, and facility layout, it is impossible for the public to gain an understanding of the project's impacts to cultural resources. This information is both available and readily obtainable and should therefore be included in the EIS. Without specific information on details of the project, and existing conditions, it is impossible for us to frame meaningful comments.
- (h) Since alteration of the environment surrounding a national register-eligible historic site is a significant impact (p. 4-96) the EIS must display alternatives that would avoid causing the impact. What sites, specifically, are threatened by direct and indirect impact?
- (i) Cultural Resource Programmatic Agreement. The conservation groups wish to be involved in the development, enforcement, and review of the programmatic agreement being prepared between the Moxa Operators, the BLM, SHPO, and ACHP. See DEIS at 4-98. Please advise us immediately in writing of the status of that effort, and the steps we must take to participate in it.

Wetlands and Riparian Areas

2-16

Riparian areas, wetlands, and floodplains should not be used for oil and gas operations, refueling, servicing, or staging. No riparian vegetation should be removed due to both its scarcity and importance in the desert ecosystem.

Contrary to the claim in the EIS at 4-39, compliance with Section 404 of the Clean Water Act does not necessarily eliminate or reduce wetlands impacts to below significant. Each year, hundreds of acres of wetlands in Wyoming are damaged or destroyed under the authority of nationwide and individual permits under § 404. Indeed, the EIS shows that "the wetlands cover type would receive 223 acres of impact, for a total of 392 acres under the construction phase." See DEIS at 4-41. This is a very significant loss of wetlands! Yet the EIS concludes that "no significant impacts are anticipated for any alternative." DEIS at 4-40.

Since Executive Order 11,990 prohibits construction in wetlands, how is it that so many acres of wetlands will be affected by the proposed action? This level of impact clearly necessitates a comprehensive wetlands analysis (including evaluation of values and functions) under the § 404(b)(1) guidelines and individual permits, rather than authorization under a nationwide permit, because of the significant cumulative effects.

The EIS indicates that "[s]pecific project impacts on waters of the U. S. cannot be accurately assessed since facility locations have not been identified." NEPA, CWA Section 404, and EO 11,990 requires this information to be available for public review

12

prior to a decision. Given the very significant potential cumulative impacts to wetlands from the proposal, the public and agencies must have access to this information in this EIS in order to evaluate less damaging practicable alternatives to the proposed action.

2-16

Cont.

In a desert ecosystem, we view any loss of any wetlands as significant. The policy of the Federal government is to avoid impacts to wetlands. We would like to see that policy implemented.

The EIS should indicate how many acres of wetlands and riparian area have been impacted in the Moxa Area, as well as in the Cumulative Impacts Analysis Area (Exhibit 4-3) from oil and gas and other activities.

Special Management Areas

12-17

The EIS should discuss the proposals potential direct, indirect, and cumulative impacts to areas under special management in and near the project area, such as Wilderness Study Areas, Areas of Critical Environmental Concern, and the Seedskaadee National Wildlife Refuge.

12-18

Wildlife

- (a) Wildlife generally, and big game in particular, have been severely impacted by energy and mineral development activities in southwest Wyoming. Due to the massive scale of proposed energy development in this area over the next two decades, we have grave concerns about the impacts of additional industrialization on the wide array of wildlife that use and inhabit the Moxa Arch area.

- (b) The EIS fails to evaluate the incremental effects of the proposed action when added to other actions and proposals in southwest Wyoming. Wildlife impacts in this area can no longer properly be described as temporary "displacement," because with each new well that is developed, there is less land for wildlife to displace to. The effects of this action must be evaluated together with all previous, existing, and proposed activities and developments in southwest Wyoming, including other gas projects, mines, livestock grazing, roads, highways, railroads, etc.

- (c) Using the term "displacement" to describe the effects to big game species when they are forced to leave crucial winter range and birthing areas (either through direct impacts, such as habitat destruction, or indirect impacts, such as human disturbance) does not fully describe the consequences of this phenomenon. Displacement of big game species from crucial winter range and birthing areas can and does cause death to individuals as well as lower birth rates generally due to increased stress and lack of habitat. The availability of crucial winter range is a limiting factor on populations. When crucial winter range is destroyed, elk, deer, moose, and antelope do not simply move away and return at a latter date when the disturbance is over. Instead, they reduce their numbers downward to adjust to the reduced availability of habitat. We are tired of seeing impacts to wildlife misrepresented in this fashion.

13

12-18

Cont.

- (d) Crucial big game winter range and birthing areas should be placed off-limits to additional development. The WGFD's policy is essentially no net loss of crucial wildlife habitat, yet the proposed action will permanently alter thousands of acres of crucial winter range. The BLM is required by NEPA to discuss possible conflicts between the proposed action and alternatives and the policies and plans of federal and state agencies. 40 CFR § 1502.16(c). How is the proposed action to develop wells in crucial wildlife habitat consistent with WGFD policy?

- (e) The EIS notes (p. 4-47) that 461 wells could be drilled in crucial antelope winter range, resulting in direct impact (excavation) to 7,052 acres. Given the declining populations of big game species in SW Wyoming, the BLM should explain to the public why it continues to find it necessary to authorize gas development in crucial wildlife habitat areas when technology exists to allow development of the mineral leasehold with much less impact from outside these areas by directional drilling, or by drilling multiple wells from single, existing well pads. The emphasis BLM places on energy development at the expense of other multiple uses and values is not only illegal, it is shortsighted and irresponsible.

- (f) Likewise, no development should be authorized in severe winter relief habitat for elk. The 101 wells proposed in this habitat areas should be moved or eliminated from the proposal.

- (g) According to the EIS (page 1-10), the Moxa Arch analysis area encompasses approximately 31,665 acres of the Seedskaadee National Wildlife Refuge. The public feels very strongly that oil and gas leasing and development activities should not take place within National wildlife refuges, yet it appears from Table 1-4 that activities are in fact being proposed within the Seedskaadee. The Seedskaadee NWR is biologically very important, and there is no good reason why it should be subjected to the impacts associated with energy development. Oil and gas development is inconsistent with the purposes for which the Seedskaadee was established, and it should not occur in the refuge.

- (h) Wildlife migration and travel corridors should be mapped and protected against surface disturbance. The EIS did not contain this important information.

- (i) The analysis of impacts to antelope (4-48) is largely based on opinions, with little supporting analysis. There is no evidence suggesting that traffic and machinery will "operate in a predictable manner" in the Moxa area, nor that antelope will in fact acclimate to human disturbance in the Moxa area. In fact, Reeve (1995) suggests that cumulative impacts from oil and gas development in SW Wyoming may significantly impact habitat use by antelope.

- (j) The BLM should not withhold mitigation simply because the threshold of significance has not been reached. Agencies are required to use all practicable means to mitigate potential adverse effects on the environment. 40 CFR § 1500.2(f).

14

12-18

Cont.

- (j) The EIS should evaluate impacts to the carrying capacity of wildlife habitat impacted by the proposal and other activities. Impact significance should not be based on the ability to meet WGFD population objectives, which do not reflect the carrying capacity of habitat, and are based on a number of non-biological factors.

- (k) We disagree with the statement (4-65) that mitigation "can only be required or enforced on BLM-administered lands." What is the authority for this statement? Impacts to wetlands, for example, regardless of land ownership, are often mitigated by the development of compensatory wetlands. This statement about BLM's inability to mitigate environmental effects concerns us. Perhaps BLM is misinterpreting its authority or policy? The EIS should include a discussion of any policy directive, manual guidance, or solicitor's opinion that relates to this matter.

- (l) Of all raptors, Ferruginous hawks are among the most sensitive to disturbance. The population of this species, while it appears relatively stable in Wyoming, has been declining for years. The EIS notes (page 4-73) that active Ferruginous hawk nests will be protected by a 0.25 to 0.5 mile buffer. Many biologist believe this distance is inadequate, and are recommending one mile buffers around active nests. Unless the buffer is extended to 1 mile, we disagree with the EIS's finding that there will be no significant impacts to this sensitive species.

- (m) All reserve pits, tanks, production ponds, etc., should be netted to prevent avian species from coming into contact with the contents, which can be and often is toxic to wildlife. Destruction of migratory birds is prohibited under the Migratory Bird Treaty Act, yet the oil and gas industry kills with impunity, evidently with the quiet acquiescence of BLM. What is BLM doing to address this problem?

Water Resources

12-19

- (a) The EIS indicates (at § 2.2.2.1 and p. 4-32) that reserve pits would be lined with an impermeable membrane liner to prevent seepage "if deemed necessary during the individual well site APD review . . ." In other words, reserve pits will be unlined. We believe that all pits should be lined in order to ensure adequate protection for groundwater resources. The risk of groundwater contamination from seepage is too great to make this requirement discretionary. The BOR apparently requires reserve pits to be lined. See DEIS at A-6. Why the inconsistent policies?

- (b) The EIS notes (p. 4-32) that reserve pits will be lined, however, if located within, among other things, groundwater recharge areas, seeps, springs, shallow water table areas, and 500 feet of stream channels. Why would pits be located in these areas? We understood BLM's policy was to prohibit the location of pits in such areas.

- (c) How many pits within the Moxa Arch analysis area are currently lined?

15



12-19

Cont.

(d) The EIS should describe any special precautions BLM or BOR will require to protect against water contamination in the Seedskaadee NWR. Steps needs to be taken to ensure that water quality in the refuge is not impaired by chemical or hazardous material spills, permitted or unpermitted discharges, illegal dumping, or groundwater or surface water contamination from outside the refuge.

(e) The EIS should describe all surface and groundwater monitoring occurring in the Moxa Arch analysis area. What baseline data exists for the area?

(f) We have heard horror stories about negligent and inadequate cementing operations in the Moxa Arch area. The EIS should discuss steps, if any, the BLM or WOGCC take to ensure cementing is done properly. Is the effectiveness of cementing tested or monitored? If so, by whom? When?

(g) The EIS states (p. 4-33) that "cementing below 1,500 feet may be necessary to comply with the order." Under the circumstances present in the Moxa area, with most wells intersecting groundwater bearing formations (DEIS at 3-26), cementing would appear to be mandatory under Onshore Order No. 2. Who determines whether cementing is necessary, and when wouldn't it be?

(h) The EIS indicates at 4-33 that corrosion of well casing has been identified as a source of groundwater contamination. What is being done to address the problem and who is paying, industry or the taxpayer?

(i) Is hazardous material disposed of in the analysis area through deep well injection (i.e., permitted under the State's underground injection control or "UIC" program) or other means? If so, please provide the location of those sites.

(j) With respect to the "impact significance criteria" outlined in the EIS (p. 4-29), significance is recognized only if degradation occurs to groundwater quality in an aquifer "directly used as a groundwater source by wells..." If the groundwater is of a quality that makes it suitable for beneficial use, any degradation is significant, regardless of whether it is being used. High quality groundwater, whether it's being used or not, is equivalent to money in the bank. The position expressed in the EIS is very shortsighted.

(k) The EIS should describe in detail the nature and levels of point source discharges occurring and anticipated in the Moxa Arch analysis area that require NPDES permits under Section 402 of the Clean Water Act. How many NPDES permits are currently in existence for operations in the Moxa Arch area? What pollutants are being discharged? Where? Have there been any permit violations reported?

(l) The EIS should also document all known water quality, air quality, hazardous waste, and other environmental laws and regulations that have been violated to date in the analysis area, and actions taken to abate those violations, as well as steps implemented to reduce future violations.

16

12-19

Cont.

(1) Cont. This information is required to develop an understanding of the existing situation and the proposal's potential environmental consequences, provides a baseline of data from which to understand impacts and to determine what monitoring and evaluation should be established, and to determine the validity of claims in the EIS that compliance with federal and state environmental laws and policies reduce impacts to levels of insignificance.

Finally, the EIS should describe that best management practices (BMPs) that will be implemented in the Moxa Arch area to control and reduce water quality degradation, and the past and present effectiveness of those measures in the Moxa field.

Air Quality

The discussion of air quality impacts in the Moxa Area EIS, although certainly more complete and informative than the Fontenelle EIS, which we found to be incomplete and sophomoric, is nonetheless inadequate because it fails to assess the true cumulative impacts from oil and gas development in southwest Wyoming. For example, among other things, it fails to consider the Fontenelle Infill Project, a proposal for over 1,000 new gas wells to the immediate north of the Moxa project. We find the lack of analysis of that project inexcusable.

12-20

To be of any utility, the air quality analysis discussion must at a minimum consider the cumulative effects from all energy and mineral development occurring or planned in southwest Wyoming. The environmental consequences of pollutant emissions generated by activities shown in Exhibit 3-3 should be analyzed. The incremental effects of all developments is having a significant impact on air quality in SW Wyoming (the DEQ has established a task force to address these impacts), yet industry is reluctant to concede that its particular project or activity plays any role whatsoever in contributing to the continuing air quality degradation in the region. An example is this statement in the EIS: "Cumulative impact would be limited to emissions from one well site plus any existing pollutant concentrations in the Moxa analysis area." DEIS at 4-4. If one looks at the Moxa field, rather than individual wells, one sees a very different picture. Using information provided in Table 4-1, one sees that during each year of the ten year development phase, the 100 plus new wells constructed each year in the Moxa area will emit levels of PM 10, CO, NOX, and SO2 in excess of threshold levels for "major emitters." When these emissions are combined with other ongoing and proposed developments, the figures are staggering. For example, a single gas processing plant like Amoco's Whitney Canyon Plant, emits thousands of tons of SO2 each year, and is a major cause of acid deposition in the Wind River Range. This information should be provided in the EIS.

The conservation groups have three principle concerns relative to air quality impacts. First, we are concerned about the negative health impacts caused by PM 10 and fine particulates. Recent studies have demonstrated a link between PM 10 and serious respiratory disease. Indeed, certain areas in SW Wyoming are in

17

"nonattainment" for this pollutant. DEIS at 3-4. We recognize that the trona industry is probably the most significant contributor in SW Wyoming, but feel nonetheless that the oil and gas industry must shoulder some of the blame. Indeed, the Moxa Arch area field will, on a yearly basis, produce sufficient levels of this pollutant to qualify as a major emitter. The EIS should provide information and analysis on this vitally important issue.

Second, we are growing increasingly concerned about potential acidification of pristine and fragile alpine lakes in the Wind River Range. The EIS admits that acid deposition in the Bridger Wilderness is a problem (the Bridger-Teton National Forest will be able to provide more information), but discounts the impacts of the Moxa project. DEIS at 4-8. Again, we feel the incremental and cumulative effects of energy and mineral development on alpine lakes and aquatic life is not receiving adequate attention in environmental analyses for projects in SW Wyoming. Development in the Moxa area, alone, will produce over 200 tons of SO2/year. An honest EIS would display yearly and cumulative totals of all criteria pollutants.

12-20

Cont.

Third, energy and mineral development, combined with other industrial activities in the region, has caused a significant decline in visibility in SW Wyoming, apparent to even the most casual observer. (We recommend consulting with Lee Gribovic, with the WDEQ in Lander, to learn more about the concerns expressed by the public over this issue). The decline in visibility concerns us because Wyoming presently benefits from the cleanest air in the country, and is fortunate to have within its borders the largest Class I airshed in the contiguous United States. Unfortunately, because a substantial portion of this Class I airshed is downwind of the development activity (i.e., Bridger Wilderness), it is threatened by activities such as the Moxa Arch project. We are saddened by the realization that energy development in Wyoming will occur at the expense of our extraordinary air resource.

The EIS should note the presence of the Class I airshed in northwest Wyoming (comprised of Yellowstone, Grant Teton National Parks and numerous wilderness areas in Montana, Idaho, and Wyoming), explain its significance (contrary to the assertion in the EIS at § 4.2.3.3, the glossary doesn't), and explain what actions or options might be available to the Forest Service to address the cause(s) of the visibility problem should an impairment finding be made.

The EIS indicates that gas would be flared for 5 to 10 days at each well. See DEIS at 2-29. The EIS should quantify the amount of gas that could be released from the 1,300 plus wells proposed in the Moxa Area, together with the Fontenelle project. The cumulative effects of this activity for the basin must also be disclosed. How much gas will be flared as a result of the development of an additional 11,000 new gas wells?

The EIS should analyze, in addition to construction impacts, the effects of the production phase on air quality. DEIS at 4-4. Although construction activity does not typically occur during production, maintenance activities do, and impacts from daily

18

traffic, workover rigs, gas compression facilities, etc., will have a discernible and cumulative impact on air quality in the basin.

A Prevention of Significant Deterioration (PSD) Class I, II increment analysis should be performed to address potential air quality impacts.

12-20

Cont.

Air quality data collected over 12 years ago, in 1983, is not appropriate for baseline reference in this EIS. See DEIS at 3-4. The situation has changed dramatically since then, with thousands of new wells and pollution sources having been permitted. Use of this data, and the apparent lack of more recent information, unfortunately illustrates how little attention is being paid to these critical air quality issues.

Roads

Implementation of the proposed action would result in the construction of approximately 795 miles of new road. See DEIS at 2-12. Immediately north of the Moxa Arch area, in the Fontenelle Area, an additional 1,000 plus wells and associated roads and pipelines are being proposed. By any measure, this is a significant new disturbance in an area that presently supports a fairly high road density. Road density in SW Wyoming is excessive in many areas, and has caused the displacement and death of wildlife, increased access and human disturbance into otherwise remote areas, caused increased air pollution from dust and vehicle exhaust, fragmented wildlife habitat, increased poaching and illegal fossil collection, increased soil erosion and stream sedimentation, destroyed wetlands and riparian areas, and has caused a host of other negative side effects.

12-21

The EIS should quantify road development activity in the Moxa Arch area as well as in the surrounding cumulative effects area. What are the present road densities in the Green River Basin? What, if any, road density standards apply? What are the maximum road densities that can occur without causing irreversible damage to wildlife and recreation resources?

The EIS should describe the effects of habitat fragmentation caused by road density on the full range of wildlife species (biodiversity) present in or that depend in some way on the Green River Basin. We remind you again that one of the basic purposes of NEPA is the full disclosure of environmental consequences before actions are taken and before decisions are made. Using information that is readily available, the EIS should be able to provide a reasonably accurate picture of SW Wyoming in ten years. We see profound changes caused by massive industrialization including thousands (perhaps tens of thousands) of miles of new roads. What do you see?

Maximum Development Scenario?

The EIS claims that the proposed action represents the maximum development scenario; i.e., 4 wells per section, yet goes on to note that "[s]ome areas with below-

12-22

19



average recovery of gas reserves may justify well densities of five to eight wells per section." DEIS at 2-1.

Even though the Moxa Operators believe that "this option is not likely on a field-wide basis[.]" the environmental consequences of gas development at a well density of 8 wells per section should, nonetheless, be assessed in the EIS. The Fontenelle EIS currently under review describes a proposal to increase well densities in the Fontenelle area to 8 wells per section. Notably, the wells are proposed in the same geologic formation being exploited by the Moxa Operators. Thus, it would be reasonable for that scenario to be considered in the EIS.

12-22  
Cont.

A leading factor in BLM's piece meal approach to analyzing the effects of oil and gas development in SW Wyoming is its unwillingness to consider reasonably foreseeable development scenarios. Witness the development of the Moxa Area itself, where BLM refused to consider the possibility of infill development in the two previous EAs. At this stage, it really shouldn't matter what the Moxa Operators think concerning the likelihood of additional infill development. Development at eight wells per section is being sought just a few miles north of the Moxa field (in the Fontenelle Field) and in the same geologic structure - thus, it should be considered in the Moxa Arch EIS.

Discussion of Monitoring Incomplete

The EIS states (§ 5.2) that the Moxa Operators would identify individuals to serve as "Environmental Compliance Coordinators." Several years ago, fresh out of high school, and with virtually no experience or training, I was once designated an environmental compliance coordinator on a large construction project. I don't know why, but I think it was because I had short hair and looked the part. It became a running joke for several months that I was going to shut the project down for environmental infractions. This position is important, and the person performing the function should be a qualified and experienced environmental engineer accountable to the BLM and the public. The EIS should describe this position and its functions in more detail.

12-23

We are aware of numerous violations of environmental laws and regulations (some continuing) in the Moxa Arch area, including illegal dumping of waste into the Green River. The EIS should provide a complete discussion of past and ongoing violations, and the steps that have been taken to correct air and water quality violations and resource damage.

Air quality impacts are becoming a serious environmental concern in SW Wyoming. Why doesn't this section include a discussion of air quality monitoring efforts in the area? The BLM has ignored this problem (particulates, visibility degradation, NOX, SO2, emissions, etc.) long enough and it bears ultimate responsibility for analyzing the air quality impacts caused by BLM-authorized activities. What work, specifically, is BLM doing to address this growing problem?

20

12-23  
Cont.

Much more water quality monitoring needs to be performed in SW Wyoming. Surface and groundwater resources have been heavily impacted by energy development activities, yet little attention is being devoted to this issue. Instead of "periodic" (§ 5.2.4) monitoring (once every hundred years is periodic), BLM needs to do regular and frequent (monthly) water quality sampling. It is unconscionable that so little groundwater monitoring has occurred to date.

What, if any, monitoring of recreation use is occurring in the Moxa Arch area? The recreation resource in SW Wyoming is being significantly impacted by energy development, yet we perceive that this issue is receiving little attention.

The EIS should provide a complete list of monitoring reports that have been prepared for the Moxa Arch area. We don't see any listed in the "References" section of the EIS.

Consistency With Resource Management Plans Not Demonstrated

NEPA requires the EIS to discuss the "[p]ossible conflicts between the proposed action and the objectives of Federal, regional, State, and local . . . land use plans, policies, and controls for the area concerned." 40 CFR § 1502.16(c).

12-24

The EIS (page 4-85) states that a management objective for the resource area is "[m]anagement activities will ensure the continued availability of outdoor recreation opportunities sought by the public . . ." The BLM is projecting up to 11,000 new wells in SW Wyoming in the next 20 years. Since much of the recreating public seeks solitude and privacy in a natural setting, how does BLM intend to continue to provide opportunities for this kind of recreational user? In light of the EIS's conclusions regarding impacts to recreation resources (§ 4.13), please describe how this resource objective is being met, particularly in Antelope Hunting Area 93.

The EIS (page 4-5) states that "[t]he KRA will be managed to protect and enhance air quality . . ." Please explain how this goal is being achieved in the Resource Area. Increased emissions of PM 10, fine particulates, SO2, and NOX resulting from this project does not "protect and enhance" air quality does it?

The EIS fails to discuss whether the proposal is consistent with the management objectives of the Seedskaadee NWR. We believe it is not. Although the EIS notes (§ 1.5.1.1) that "[a]ll public lands within the resource area have been reviewed as suitable for oil and gas leasing and development . . ." a similar finding is not made with respect to the wildlife refuge. The EIS should discuss this issue. The Final EIS should include the comments submitted by the BOR, a cooperating agency.

Inadequate Range of Alternatives

12-25

An EIS "shall provide full and fair discussion of significant environmental impacts and shall inform decisionmakers and the public of the reasonable alternatives

21

which would avoid or minimize adverse impacts or enhance the quality of the human environment." 40 CFR § 1502.1.

12-25  
Cont.

The tone and substance of this and other energy development-related environmental documents prepared for projects in Wyoming suggests that energy development on public lands is a foregone conclusion: that it is unavoidable, legally required, and the highest and best use of the land. This attitude and belief is reflected not only in this document, but in virtually all BLM-approved EISs prepared for energy development projects and resource management plans affecting Wyoming. A quick review of the BLM's RMPs for Wyoming reveals that virtually all (typically 95-100%) of the public lands administered by BLM are available for oil and gas leasing and development. Typically, the only areas off-limits to oil and gas leasing and development are those areas legally protected, such as wilderness study areas. Most of the legally-available lands are in fact under active lease, and the BLM maintains a very active leasing program to ensure that public lands not leased do not remain that way for very long. BLM's bias, both historical and present day, is mineral development, and nowhere is that bias more evident than in Wyoming, particularly southwest Wyoming.

No Action

The Moxa Arch EIS dismisses the No Action Alternative believing it to be outside the authority of the BLM to implement. See DEIS at 2-39. The EIS is wrong, as is the premise on which BLM bases its erroneous conclusion. The BLM has made this argument before (that it lacks authority to implement a no action alternative) in similar circumstances (see, e.g. Hay Reservoir EA, Bravo Field Development EA, Fontenelle Infill Drilling Project EIS and WOC's comments in response thereto), and we have tried to explain on more than one occasion why BLM's conclusions regarding its supposed lack of authority to implement a no action alternative are incorrect. Unfortunately, as shown by this EIS, the BLM appears to have ignored our analysis of this issue, preferring instead to force resolution in a more formal venue. For your information, we reference and incorporate herein the National Wildlife Federation's comments, dated June 6, 1995, on the Fontenelle Natural Gas Infill Drilling Projects EIS, and the comments submitted by the Land and Water Fund, dated June 6, 1995, on the BTA Oil Producers Bravo Field Development EA, both of which contain excellent legal analyses of the no action alternative issue.

12-26

In light of the comprehensiveness of those comments, it appears nothing further would be gained by providing additional legal analysis of this issue in these comments. You have been fully apprised of the issue, and have chosen to ignore our concerns. Suffice it to say that the Moxa Arch EIS fails to contain a meaningful analysis of the No Action alternative. We believe that on each lease where development has occurred or is occurring, you have the authority to implement and must consider the no action (no additional development) alternative. No additional infill development on some or all of the leases in the analysis area is a reasonable alternative as it address, at least in part, our concerns about habitat fragmentation, excess roading, displacement of other uses, and a host of other resource concerns. Infill development is not legally mandated, and

22

12-26  
Cont.

the obligation to provide for additional development opportunities within the expanded Moxa Arch area exists nowhere except in your imagination.

One Pad/Multi-Well Directional Drilling Alternative

The DEIS dismisses without adequate explanation an alternative with significant environmental and economic advantages: directional drilling from existing and newly constructed single well pads. According to the DEIS, "the multi-well, single pad design provides for construction of one well pad with as few as two or as many as five wells drilled from a central location. This design and setup provides for one access route for multiple wells along with common gathering, separation, storage, and transportation." DEIS at 2-19. The economic and environmental benefits of multi-well, single pad design are discussed on page 2-8 of the DEIS.

12-27

We believe that field development in the Moxa Arch area can be achieved using directional drilling techniques from existing well pads, and that the DEIS is legally deficient for not considering this alternative for some or all of the leases, particularly in areas containing sensitive resources such as steep slopes, wetlands and riparian areas, visually-sensitive Class II areas, unstable or high risk soils, crucial big game winter range, developed and important recreation areas including the Green River and Hams Fork corridors and within one mile of Seedskaadee NWR, and significant cultural and historic sites and trails.

The DEIS indicates (page 2-1) that the multi-well single pad "technique may be used by the Moxa Operators in order to reduce environmental impacts and drilling and production costs, and in order to develop marginal areas/properties." (emphasis added). This statement implies that the operator, not BLM, will decide whether to utilize directional drilling from single well pads. We believe this is wrong. The BLM should decide, after consultation with the operator and analysis of environmental and economic considerations, whether to require multiple wells from a single pad.

Under a variety of authorities, including the Mineral Leasing Act, Federal Onshore Oil and Gas Leasing Reform Act, and FLPMA, the BLM has the authority to regulate surface occupancy and use, including requiring an operator to utilize the multiple well, single well-pad technique. The technique must be used if it can prevent "unnecessary and undue damage." The DEIS should clarify that BLM possesses the authority to condition surface occupancy on the use of this technique, and explain when the decision is made, since it apparently is not being made in this document.

Energy Conservation Alternative

12-28

NEPA requires the agency to discuss in EISs the "[e]nergy requirements and conservation potential of various alternatives and mitigation measures" as well as the "[n]atural or depletable resource requirements and conservation potential of various alternatives and mitigation measures." See 40 CFR § 1502.16(e), (f). We do not see in the EIS a discussion that satisfies these requirements.

23



12-28  
Cont.

Since BLM's policy appears to be the development of fossil energy reserves at the fastest possible pace, and since it appears to be aggressively implementing in SW Wyoming a plan to develop the region's natural gas reserves, we believe it would be appropriate for the EIS to consider alternatives which achieve the ultimate objective of the action - satisfying America's need for cheap, clean, efficient energy. The Moxa Arch Project is one component of a larger program to develop SW Wyoming's energy reserves; thus, environmentally-benign alternatives that can achieve the objective of energy production - such as energy conservation - should be analyzed in this EIS.

Approximately 20 years ago, the BLM and the Department of Energy explored the alternative of energy conservation carefully in a series of programmatic EISs before irrevocably committing the federal coal reserves in the Powder River Basin to development-the BLM should and must do the same here.

Resource Protection Alternative

12-29

The EIS should describe and consider an alternative that is designed to maximize resource protection opportunities while still allowing a reasonable level of gas development. This alternative would prohibit further surface occupancy in Class II VRM areas, and limit well pad density in Class III area to a maximum of 1 well pad per section, prohibit further development in crucial winter range as identified by WGFD, and restrict development within 1 mile of the Green and Hams Fork rivers and historic trails, and prohibit development on steep slopes, wetlands, riparian areas, and erosive or sensitive soils. Oil and gas activities should be prohibited within the Seedskaadee National Wildlife Refuge.

NEPA's Integration Requirements

12-30

The CEQ's NEPA regulations provide that "[t]o the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with environmental impact analyses and related surveys and studies required by the Fish and Wildlife Coordination Act [citation omitted], the National Historic Preservation Act of 1966 [citation omitted], the Endangered Species Act of 1973 [citation omitted] and other environmental review laws and executive orders." 40 CFR § 1502.25. See also, 40 CFR §§ 1500.2(c), 1500.4(k), 1500.5(a), 1501.1(a), and 1501.2. This requirement must be met to allow full disclosure of environmental consequences and informed decisionmaking-the point of NEPA.

Like virtually all BLM-supervised EISs we have reviewed, the Moxa DEIS fails to comply with this important requirement. This project necessitates a number of other environmental reports and studies which should be prepared concurrently with and integrated with this document. For example, the EIS failed to contain the analysis required by § 404 of the Clean Water Act, and specifically an analysis under the § 404(b)(1) guidelines. On a related matter, the EIS did not contain the analysis required

24

under Presidential Executive Orders 11990 and 11988, which prohibit federally-approved construction in wetlands and floodplains.

Table 1-4 lists federal, state, and county authorizing actions, many of which require independent environmental analyses and surveys. The EIS should be integrated with and prepared concurrently with the studies and reports required under these authorizations.

Studies and reports required under the National Historic Preservation Act, specifically a Class III survey, are lacking in the EIS.

12-30  
Cont.

The studies required by FLPMA and the Mineral Leasing Act for the grants of rights-of-way should have been included in the EIS. When will the public have an opportunity to review and comment on the transportation plan? This should have been included in the EIS.

Class I and Class III paleontology surveys (§ 4.4.6) should have been included in the EIS. What is the reason they were not included?

The transportation plan promised in the EIS at page 2-33 (§ 2.2.4.2.3) and pollution prevention plan (page 2-35) should have been made available for public review and comment.

The Spill Prevention Control and Countermeasures Plan (page 2-35) should have also been made available for public review and comment in this EIS.

Other studies and reports missing from the EIS or simply not available include a rare plants survey, raptor surveys, prairie dog colony maps, wetlands delineation, and sage grouse lek surveys. This information is available or reasonably obtainable and should properly have been included in the EIS. See 40 CFR § 1502.22.

The evaluation required by the "Windy Gap Decision" (p. 4-32) must be integrated with this EIS. We wish to participate in that process.

On a positive note, we were pleased to see the letters from the USFWS contained in the DEIS at Appendix F. The Final EIS should include the USFWS's review (biological opinion) of the BLM's biological assessment.

Finally, thank you for including in the DEIS (Appendix C) a hazardous substances management plan. That information was lacking in the Fontenelle Infill Gas Project EIS.

Consultation and Coordination

12-31

The DEIS (§ 6.1.1) lists the government offices, organizations, and individuals that "either provided comment or were provided the opportunity to comment during

25

12-31  
Cont.

the scoping period." From this list, it appears that neither the National Park Service nor the USDA Forest Service (Wyoming and Colorado) were notified of the opportunity to comment on the proposed action. Public lands and resources under the jurisdiction of these federal agencies have been dramatically affected by the development of energy resources in Southwest Wyoming and will be affected by the proposed action. Consequently, those agencies must be directly involved in the environmental review process for the proposed action.

Air Quality

12-32

The State of Wyoming is fortunate to have some of the cleanest air in the United States. The country's largest Class I airshed (see § 169A of the Clean Air Act) is comprised of Grand Teton National Park, Yellowstone National Park, and numerous Congressionally-designated wilderness areas within Idaho, Montana, and the Shoshone and Bridger-Teton National Forests of Wyoming. Under the Clean Air Act (CAA), Grand Teton and Yellowstone National Parks, and the Shoshone and Bridger-Teton National Forests have administrative authority over the Wyoming portion of this Class I airshed.

According to the diagram of wind direction (Exhibit 3-1, p. 3-5), the Bridger and Fitzpatrick Wilderness Areas, both of which are CAA Class I areas, are in the downwind track of the Moxa Arch field at least 35-40% of each year. Additionally, Table 4-4, p. 4-9, lists lakes in the Bridger Wilderness as potential receptors of acid emissions from this project. It is disturbing that even though the EIS itself shows that the project may have an effect on downwind air and water resources, no effort is made to solicit the views and concerns of the agencies with jurisdiction over those resources.

Under NEPA § 102(2)(C), BLM has a legal duty to obtain the comments of any Federal agency with jurisdiction over or special expertise with respect to any environmental impact of a proposed action. See also 40 CFR §§ 1501.6, 1501.7(a)(1), and 1503.1. Moreover, we know for a fact that Forest Service and National Park Service staff have requested greater coordination and communication with BLM over air quality issues in Wyoming, and BLM's repeated disregard of this huge problem of lack of interagency coordination/ communication is not only illegal under NEPA, but also a serious breach of ethics and good practice. Please tell us why these agencies were not notified of the comment opportunity and the availability of the EIS. The public deserves and has a right to comment on an EIS that has received the benefit of interdisciplinary (and interagency) preparation and review.

Energy development in Southwest Wyoming is a major cause of visibility and air quality degradation in Wyoming. It sure would be nice if the federal agency responsible for authorizing most of this development would assume some responsibility for informing the public of the cumulative and regional environmental consequences of this development. To date, the public has been deprived of such an analysis.

26

Indirect Effects

12-33

The environmental consequences of energy development in Southwestern Wyoming are unfortunately not confined to that region, nor are they only direct in nature. Profound changes resulting from the conversion of southwest Wyoming to an industrial landscape are occurring in areas as far away as Pinedale and the upper Green River area, perhaps farther. Oil and gas energy development in SW Wyoming has caused increased recreational use in outlying areas of the Red Desert and southern Bridger-Teton National Forest. There are two principle reasons for this. First, energy development has caused a significant increase in the populations of urban areas in SW Wyoming. We don't have the figures handy, but are reasonably certain that the principle reason for the tremendous growth of Sweetwater, Lincoln, Sublett, Carbon, and Uinta counties during the past two decades is primarily energy development. No BLM-prepared EIS that we have seen has considered the broader questions of how changes in population and demographics caused by the cumulative effects of energy development have impacted the human environment, as that term is used in NEPA. See 40 § CFR 1508.14. Although the face of southwest Wyoming has changed profoundly during the past 20 years as a result of energy development, much of it BLM-authorized, we do not see where the BLM has accurately and honestly described the true extent and nature of the changes. Until these changes are described, we view all EISs prepared for energy development projects in SW Wyoming as being per se legally inadequate. To give you an idea of what we are talking about, we have enclosed for your information a short story written by William Kittredge, called *Overthrust Dreams*. We hope you both enjoy it and learn from it. Not everyone agrees that the conversion of southwest Wyoming to an industrial landscape is a positive thing. We believe you have an obligation to discuss both sides of the issue.

Second, extensive industrial and energy development in SW Wyoming has physically reduced and, in some areas eliminated, opportunities for solitude and natural (i.e., away from roads, powerlines, structures, etc.) recreation experiences. Not too long ago, one could literally spend days exploring mile after mile of extensive areas in the Red Desert and Great Divide Basin and not encounter a single vehicle or other sign of human presence. Today, such an experience is rare, if it occurs at all. Because of the extensive road network and increased human presence that has resulted from energy development, it is becoming increasingly difficult for people who prefer this kind of recreational experience to find opportunities for it in SW Wyoming. Thus, they are forced either to abandon that form of recreation, lower their expectations, or travel greater distances to find it. Large numbers of SW Wyoming-based recreationists travel to the B-T National Forest in search of this kind of recreational experience (semi-primitive non-motorized and semi-primitive motorized).<sup>1</sup> Cumulatively, the impacts to

<sup>1</sup> You would know this if you took the time to consult with B-T National Forest recreational specialists. Ask them about the Travel Plan for the Pinedale District. Snowmobile and off-road (ORV) vehicle use on the BT has increased dramatically in recent years, and those activities are causing

27



Working for the Nature of Tomorrow.



NATIONAL WILDLIFE FEDERATION

Rocky Mountain Natural Resource Center  
2260 Baseline Rd., Suite 100, Boulder CO 80302

303/786-8001  
FAX 303/786-8054

June 16, 1995

Via Facsimile

Bill McMahan, Project Coordinator  
Bureau of Land Management  
P.O. Box 1869  
Rock Springs, WY 82902-1869

Re: Moxa Arch Natural Gas Infill Drilling Projects Draft Environmental Impact Statement; Comments

Dear Mr. McMahan:

The National Wildlife Federation (NWF) submits the following comments to the Moxa Arch Natural Gas Infill Drilling Projects Draft EIS (Moxa Arch DEIS). Thank you for allowing us an extension until today to present our remarks.

I. GENERAL

The Moxa Arch DEIS is seriously lacking in its depth of analysis of environmental impacts from the proposed project. As we have repeated advised you with respect to other environmental analyses concerning gas development in this region, the DEIS fails to comply with the National Environmental Policy Act 42 U.S.C. § 4332, *et seq.* (NEPA) because it does not adequately explore the cumulative impacts of this and other gas and oil projects and other activities in surrounding areas, nor does it adequately address impacts on private and state lands within the analysis area. It also fails to comply with NEPA because it does not give consideration to a no action alternative or to any alternative which would meaningfully reduce the impacts on the environment.

II. SCOPE OF DEIS

A. INADEQUATE CONSIDERATION OF CONNECTED, CUMULATIVE AND SIMILAR ACTIONS

Our comments relating to the inadequate consideration of connected, cumulative and similar actions in the DEIS, are virtually identical to those submitted by NWF concerning the Fontenelle Infill Drilling proposal on June 6, 1995 ("NWF Fontenelle Comments"), and we incorporate those comments by reference.

Bill McMahan  
June 16, 1995  
Page 2

In the NWF Fontenelle comments we noted the DEIS failed to mention the existence of the Moxa Arch field, which lies immediately to the south of the Fontenelle. Likewise, the Moxa Arch DEIS neglects to mention the Fontenelle Infill proposal for over a thousand additional wells. Once again, BLM appears determined to conceal from the public the cumulative impacts of these and other developments.

Remarkably, the Moxa Arch DEIS does not mention any other oil and gas project in the region. It adopts an even more limited approach to its cumulative effects analysis than even the Fontenelle DEIS, drawing a line around the immediate development area, and completely ignoring activities outside that boundary. Such an arbitrary designation cannot support meaningful scientific analysis, as it artificially fragments habitat, socio-economic boundaries, airbeds and watersheds.

Like the Fontenelle DEIS, the Moxa Arch DEIS also fails to address reasonably foreseeable development (40 C.F.R. § 1508.7), even though BLM has publicly stated that southwestern Wyoming may harbor one of the largest gas reserves in the world, and intensive development throughout the area is anticipated. BLM cannot adequately address the overall development picture without an honest analysis of anticipated future projects.

Accordingly, the scope of the Moxa Arch DEIS is inadequate and violative of NEPA in its failure to discuss the connected, cumulative, similar and reasonably foreseeable mineral development in southwestern Wyoming. Please revise the EIS to give a full summary of all such pending, recently approved or likely projects in the region, and an analysis of how the Moxa Arch proposal will fit into the overall development pattern.

B. INADEQUATE ANALYSIS OF PROJECT ON PRIVATE OR STATE LANDS

An additional and very serious shortcoming of the DEIS is its failure to identify and adequately evaluate the fact that fully one-half of the Moxa Arch lands are privately or state-held, in the checkerboard pattern. Although the document discloses the total acreage within the analysis area which is not federally owned, and makes some disclaimers regarding its ability to enforce mitigation on those lands (which we discuss below), this more or less ends the discussion. It is not even clear whether the proposed 1,300 wells are just those wells proposed for federal lands, or whether this is the total number for all lands. If the latter, nothing is said as to what proportion of these are expected to lie on federal lands and which will lie on state or private lands. Without this vital

12-33 Cont. Wyoming's public lands and resources from increased recreational use by residents of Rock Springs, Rawlins, Green River, Evanston, and other energy-dependent communities have been significant, and should properly be considered in this EIS. See 40 CFR §§ 1502.16(b), 1508.8.

A Third Party Contractor Prepared the EIS

The DEIS (page C-1) states that the BLM prepared the EIS. That statement is incorrect. Holsan Environmental Planning, a private consulting firm paid by the Moxa Operators, prepared the EIS. The EIS should include a copy of the conflict of interest disclosure form required by NEPA in these circumstances. We believe the reason why so many EAs and EISs tend to underestimate the environmental consequences of energy development in southwest Wyoming is because the environmental consulting firms preparing the documents have an economic interest in future energy development in this region.

Incorporation by Reference

We hereby incorporate by reference the comments submitted by the U. S. Environmental Protection Agency, the U. S. Fish and Wildlife Service, U. S. Army Corps of Engineers, and the Wyoming Game and Fish Department on the above-captioned action, as well as their comments on the Fontenelle Natural Gas Infill Drilling Project EIS. We also adopt and incorporate by reference our own comments on the Fontenelle EIS, as well as the comments submitted by the National Wildlife Federation, Wyoming Wildlife Federation, Land and Water Fund, and the Sierra Club Legal Defense Club on the Moxa Arch and the Fontenelle Project EISs.

Bonding

The EIS should disclose the amount of the bond BLM has received from the operators for reclamation and clean up of the field upon abandonment. The public should not be left with the responsibility to clean up someone else's mess, as is unfortunately so often the case.

Thank you for the opportunity to comment on the Expanded Moxa Arch Area EIS. Kindly notify the individuals listed below of additional comment opportunities and the availability of related environmental documents or studies. We also request written notice of any applications for permits to drill (APD) and requests for waivers, modifications, or exceptions to lease stipulations related to the Moxa Arch area development. Notices of APDs posted at BLM offices hundreds of miles from our

considerable resource damage on the Forest. A large percentage of this use is coming from SW Wyoming, and in particular from folks employed by the oil and gas industry. This writer has worked in the oil and gas industry and knows first hand that many individuals employed in the industry enjoy outdoor activities (camping, hunting, boating, etc.) more than the "average" person. I believe polls and studies support my experience.

28

Sincerely,

*Dan Heilig*

Dan Heilig  
Associate Director

cc: Meredith Taylor  
Greater Yellowstone Coalition

Kirk Koepsel  
Northern Plains Office, Sierra Club

Jeff Kessler  
Friends of the Bow/Biodiversity Associates

enclosures

29

12-35 Cont. locations, without more, hardly satisfies your obligation under NEPA to "make diligent efforts to involve the public in preparing and implementing NEPA procedures." 40 CFR § 1506.6.

13-1

13-2

13-2 Cont.

13-3



Bill McMahan  
June 16, 1995  
Page 3

13-3  
Cont.

information it is impossible for the reader to gain an accurate understanding of the impacts of the proposal. If BLM does not know this information, it is likewise impossible for it or the reader to have an accurate understanding of the impacts of project.

Please make dramatic revisions to the EIS to answer these critical questions regarding the interface of public and private lands.

C. NEED FOR PROGRAMMATIC EIS

13-4

Our request that BLM engage in a Programmatic EIS for gas development in southwest Wyoming is well documented, and is identical to the request made in the NWF Fontenelle Comments. We incorporate those comments by reference, as well as the comments of the Sierra Club Legal Defense Fund.

D. INADEQUATE RANGE OF ALTERNATIVES

13-5

Consideration of alternatives is at the heart of NEPA analysis. 40 C.F.R. § 1502.14. To comply with NEPA an agency must "rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated." 40 C.F.R. § 1502.14(a). The EIS must also consider reasonable alternatives not within the jurisdiction of the agency (§ 1502.14(c)) and must include the alternative of "no action". 40 C.F.R. § 1502.14(d).

The Moxa Arch DEIS fails to comply with these requirements.

1. ABSENCE OF MEANINGFUL CONSIDERATION OF THE NO ACTION ALTERNATIVE

13-6

The DEIS takes the extraordinary position that in this instance the "no action" alternative will mean "that on-going natural gas production activities would be allowed to continue by the BLM in the Expanded Moxa Arch Natural Gas Development Area, but the proposed field development program . . . would be disallowed." DEIS at 2-39. Quite obviously, such a development scenario is not one of "no action." No action means that no further gas development will be allowed, not that the operators will be allowed to proceed one well at a time and ultimately achieve the same result as the Proposed Action. Such a suggestion is ludicrous and cannot withstand legal challenge.

The purported explanation at 2-39 as to why BLM must allow development, is flawed. As the drafters of the Fontenelle DEIS attempted to do, the Moxa Arch

Bill McMahan  
June 16, 1995  
Page 4

13-6  
Cont.

DEIS drafters claim the mere fact a lease has been issued requires BLM to allow the proposed development. This notion is unsupported in the law. Even if it were assumed the holder of a lease must be allowed some development rights, the operators of the Moxa Arch field have already been allowed extensive development of their leases. Please see our discussion of this issue at pp. 5-6 of the NWF Fontenelle Comments, which are incorporated by reference.

Moreover, all contracts with the United States assume compliance with Federal law, including NEPA, FLPMA, the Clean Air Act and the Clean Water Act. No authority requires BLM to allow unrestrained development which runs afoul of these statutes, or otherwise compromises the health, safety and well-being of the public.

Even if the analysis at 2-39 were accurate, that BLM is without authority to limit development on the leases, the validity of the leases themselves would be called into question because such leases have been issued without compliance with the National Environmental Policy Act, to the extent they effectively preclude the no action alternative. See, e.g., *Sierra Club v. Petersen*, 717 F.2d 1409 (D.C. Cir. 1983); *Conner v. Burford*, 836 F.2d 1521 (9th Cir. 1988); *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223 (9th Cir. 1988).

2. INADEQUATE CONSIDERATION OF LESS INTRUSIVE ALTERNATIVES

13-7

The DEIS also fails to identify any alternative which will minimize impacts on the environment, even though such alternatives are readily available to BLM and the operators. This is particularly apparent with respect to wildlife issues, discussed more fully below. The DEIS fully admits the serious impacts on wildlife. Important and crucial habitat will be significantly disrupted and potentially lost forever. Yet none of the considered alternatives requires anything but the most minimal mitigation of those impacts. The only difference between the Proposed Action and Alternative A is an unexplained reduction in the number of wells in the flank area, and Alternative B is simply the Proposed Action done on an *ad hoc* basis.

It is apparent that techniques are available for minimizing impact to the environment without compromising the extraction of gas reserves. For example, the drafters admit (as they did with respect to the Fontenelle proposal) that directional drilling is a viable, useful and even economical method for minimizing impacts in sensitive areas. DEIS at 2-19. The DEIS also suggests that the operator may use horizontal drilling to improve the efficiency of marginal wells.

Bill McMahan  
June 16, 1995  
Page 5

13-7  
Cont.

Other means of minimizing impacts from pollutants may include reinjection of drilling fluids/muds, use of tanks rather than pits, and full lining and netting of pits. Why is there no greater commitment to requiring such procedures, when BLM admits the Proposed Action will have considerable impacts on a variety of different resources?

Please include in the FEIS a discussion of alternatives which will minimize impacts through such available techniques, and/or which will provide substitute habitat.

III. ENVIRONMENTAL CONSEQUENCES

An EIS must provide a full and fair discussion of significant environmental impacts. 40 C.F.R. § 1502.22. The Moxa Arch DEIS is deficient in this regard for the following reasons.

A. DISCLOSURE OF DISTURBANCES

13-8

The description of impacts in the DEIS inaccurately suggests to the reader that the effects of over 1,300 new wells in the Moxa Arch area is negligible. Common sense tells us otherwise, yet the DEIS is alarmingly glib in its prediction of minimal impacts. An example of this is the Moxa Arch DEIS's measurement of disturbance only in terms of the direct loss of acreage from construction of the well pad, roads and pipelines, ignoring the burgeoning spider web of development which eventually precludes other uses of the land. See NWF Fontenelle comments, at p. 7, which are incorporated by reference.

B. AIR QUALITY IMPACTS

13-9

The DEIS is shortsighted and incomplete with respect to its analysis of air quality impacts. It looks only at fugitive dust emissions from the construction sites, and ignores cumulative impacts from other activities, as well as proven or strongly suspected deterioration of downwind airsheds resulting from gas development in the greater Green River basin. See NWF Fontenelle Comments, at 10.

The DEIS states at 4-4 that "Of the two phases, the first phase [of construction] is by far the larger emitter of air pollutants . . . Therefore, air quality impacts from only the construction phase [not production] are examined in this chapter." We find this comment particularly disturbing. Even assuming that the drafters are correct that construction causes more

Bill McMahan  
June 16, 1995  
Page 6

13-9  
Cont.

pollution than production, this does not give them the liberty to omit any analysis of impacts from production.

Please give a thorough analysis of *all* air impacts, including those relating to gas processing plants and similar associated developments.

In addition, some of the data on air impacts is presented in such a fashion as to make it exceedingly difficult for the layperson to evaluate. For example, the tables found at 4-6 purport to demonstrate that emission rates per well will not exceed established threshold levels. But there is no quantitative explanation of "threshold level." Is this a level specifically established for emissions gas wells? Or does it refer to the acceptable rate of emission from all sources for a given quantity of air? If the latter, what is that quantity? If it is for an area *larger* than that which will be affected by emissions from a given well, obviously this information is misleading and indeed meaningless. Please clarify this information so the reader will have an accurate understanding of the air quality impacts.

C. SOILS IMPACTS

13-10

The DEIS gives a fairly good explanation of the impact of the project on soils, which may be quite significant. DEIS at 4-20 - 4-28. Yet it stops short of disclosing the most important conclusion to be drawn from the data. If we are to understand Table 4-7 correctly, even with all erosion controls in place the erosion rates far exceed the tolerance level of two tons/acre/year (DEIS comment at 4-22.) Moreover, the mitigation summary does nothing to assure that these effects can be reduced or avoided, stating the recommended measures are merely guidelines which "should be" utilized as necessary. This is unacceptable under NEPA. Overall the issue deserves further study and disclosure, and the implementation of enforceable mitigation or avoidance measures.

Once again, the discussion of cumulative impacts of surface disturbance (DEIS at 4-28) does not include any consideration of other activities underway in the region, on either public or private lands.

The Kemmerer RMP requires that existing road locations be used where possible to minimize surface disturbances. RMP, at 17. The RMP also requires the clearing of pipeline ROWs to be accomplished with the least degree of disturbance to topsoil. *Id.* There is no analysis of these requirements in the DEIS. Are we to assume that such requirements have



Bill McMahan  
June 16, 1995  
Page 7

13-10  
Cont.

been waived with respect to the Moxa Arch operators? If so, please explain why waivers were granted. If not, please include a discussion of how these requirements are being met. Again, a very plausible means of minimizing disturbance is to require multiple well drilling from a single pad, and use of directional or horizontal drilling. There also are techniques available to minimize disruption of the soils from pipelines (e.g., raised lines).

D. WATER QUALITY IMPACTS

13-11

The discussion of measures designed to protect water resources from migration of well fluids is confusing. At 2-35 the DEIS suggests that all wells will be cased in accordance with Onshore Order No. 2 to protect accessible high quality water aquifers. In the same paragraph it is stated that wells will adhere to the Moxa Arch cementing policy described in Section 2.2.3.1, which requires only some cementing. Does Onshore Order No. 2 require casing of all wells, or just those near high quality aquifers? Is the Moxa Arch policy consistent with the Order, or is it less restrictive.

13-12

The DEIS suggests that pits will be lined when necessary to protect sensitive aquifers and groundwater resources (DEIS at 2-35). Bureau of Reclamation Stipulations for Surface Use (Oil and Gas Well Drill Sites and Access Roads) recommend all reserve pits be incut and lined with either 12-mil nylon reinforced plastic and, in some cases also with geotextile fiber, to mitigate migration of water/chemicals from the pits into adjacent water supplies. This is standard procedure in many areas of the country, considered necessary to protect both water resources and other mineral resources which could be contaminated by migration of pollutants from pits. In an area such as this, where water supplies are limited and resources sensitive to additional loading of pollutants, it would appear critical. Please explain why the DEIS does not consider in its alternatives the lining of all pits when chemical pollutants are present.

13-13

We find no discussion in the DEIS of netting of ponds to protect migratory birds. Bird mortality from contaminated ponds is becoming a significant problem in southwest Wyoming. Please address the issue in the FEIS.

13-14

The DEIS states that baseline data for water resource depletion in the area is unavailable. This critically important information should be available from either the state or the operators. But if not, and it is capable of being ascertained, BLM must commission the appropriate studies. 40

Bill McMahan  
June 16, 1995  
Page 8

13-14  
Cont.

C.F.R. § 1502.22(a). In any event, BLM cannot reach conclusions regarding impacts without such data.

E. WETLANDS IMPACTS

13-15

The DEIS indicates that approximately 1% of the area is wetland. Disturbance of wetlands is to be avoided whenever possible. However the disturbance of an additional 223 acres (165 acres were affected by previous activities) is possible and it is significant, particularly given the arid nature of this region. Please explain how the Proposed Action will comply with the Clean Water Act.

F. WILDLIFE IMPACTS

13-16

The discussion of impacts to wildlife is generally insufficient, for the following reasons:

(a)

Thirty-five percent of wells (461) will be drilled in the heart of pronghorn crucial winter range. DEIS at 4-47. This is in addition to a similar number of wells which already exist in this habitat. This is an unacceptable level of impact, given the substantial shortcomings in BLM's consideration of a range of less intrusive alternatives. Reliance on reclamation is insufficient to mitigate the significant impacts from this activity because it cannot be enforced and is many times unsuccessful. Moreover, the reclamation of shrubs, which are of most critical importance to pronghorn, is difficult and takes at least 20 years.

(b)

The drafters admit that use of multiple-well single pad design would substantially reduce this disturbance. DEIS at 4-48. Yet there is no requirement that these procedures be used.

(c)

The DEIS assumes that "[a]ntelope will acclimate to increased traffic volumes and machinery as long as machinery moves in a predictable manner." (DEIS at 4-48). Yet the data on this point is not conclusive. In fact the scientific literature, much of which is based on empirical evidence of the impacts of gas development in such places as Canada, suggests that pronghorn do indeed suffer from the cumulative impacts of such development. Moreover, there is nothing in the DEIS to suggest that such movement will indeed be "predictable." There is also no discussion of impacts to migrating herds trying to reach crucial range, who are not necessarily accustomed to the disturbance.

Bill McMahan  
June 16, 1995  
Page 9

13-16  
Cont.

(d)

As we saw in the Fontenelle DEIS, there are no defined projects to mitigate harm to wildlife, and therefore any conclusions of "insignificance" based on mitigation, cannot be supported.

(e)

In this regard it is essential that BLM consider offsite mitigation of these projects. There is no successful means of mitigating the cumulative impacts of these projects on wildlife without efforts which extend beyond the well pad, such as creation of substitute habitat.

(f)

Moreover, BLM apparently takes the position that there is no mitigation which can be enforced on private or state lands, fully one half of the analysis area. This is highly significant, given the checkerboard pattern of ownership. Accordingly, the DEIS cannot legitimately ensure that negative impacts can be mitigated.

(g)

The DEIS's use of WGFD population objectives as a criterium for determining significance of impact (DEIS at 4-44), is inappropriate and misleading. Such objectives are socially determined and are below carrying capacity. They are not useful indicators of the health of habitat of herd units. The DEIS must base its analysis on actual carrying capacity and documented animal populations. Habitat losses prevent the WGFD from being able to manage herd populations and increase numbers where necessary, which causes a significant adverse impact to this use of the land.

(h)

The DEIS states that wildlife will be displaced (See, e.g. DEIS at 4-52 re: sage grouse). But because the document is inadequate with respect to its discussion of the overall development pattern in this region of the state (i.e., cumulative impacts), it tends to gloss over the fact that wildlife cannot be indefinitely displaced from project area to project area. Eventually the animals have nowhere to go. Accordingly, the DEIS cannot conclude that there are no significant impacts based on the animals' ability to move around.

(i)

Like the Fontenelle DEIS, the Moxa Arch DEIS gives a flawed analysis of the effect of the project on wildlife, because it is without adequate baseline data to reach any conclusions of impact. See NWF Fontenelle Comments at 7-8, which we incorporate by reference.

(j)

The DEIS states that a number of threatened or endangered species could be present in the area, although sightings in recent years have been down or non-existent. These facts are disturbing and cannot be dismissed

Bill McMahan  
June 16, 1995  
Page 10

13-16  
Cont.

(j)  
Cont.

as mere curiosities. There must be a discussion of whether these decreases might be attributable to the existing development of the area. If so, further development may not be indicated, particularly if there have been impacts to threatened or endangered species. At a minimum, these declines in population are warning flags which warrant further study of these species in the area.

G. RECREATION

13-17

The potential ban on hunting in the Moxa Arch analysis area (DEIS at 4.9.6.4) is not an insignificant impact. In general, the admitted displacement or deterioration, and in some cases complete elimination of recreational uses in the Moxa Arch analysis area and surrounding areas (See e.g., DEIS at 4-85), violate BLM's multiple use obligations under FLPMA. It may also be inconsistent with the Kemmerer RMP. Please give further explanation as to how the choice of the Proposed Action meets BLM's multiple use objectives under FLPMA, and a thorough consideration of all means of mitigating this impact.

IV. MITIGATION

13-18

Mitigation measures cannot be simply vague statements of good intentions. *Audubon Soc'y of Cent. Ark. v. Daily*, 977 F.2d 428, 435-36 (8th Cir. 1992). As we saw with the neighboring Fontenelle project, the mitigation requirements set forth in the Moxa Arch DEIS are generally vague and unenforceable. Perhaps mitigation measures will be made more specific and enforceable in the ROD. But if not, they cannot be utilized by BLM to reach conclusions of no impact or insignificant impact.

The statement at 4-65 that "[m]itigation identified, although desirable, can only be required or enforced on BLM-administered lands," is not wholly accurate. As noted above, in determining whether to authorize action agencies are required to take into consideration factors outside their own jurisdiction. If BLM cannot adequately regulate the activities on fully one-half of the Moxa Arch lands, then it must take this factor into consideration in determining what level of activity it can approve on federal lands. If the operators will be allowed to intensively develop private and state lands with no mitigation of harmful effects, then BLM's own obligation to minimize, if not completely eliminate effects on federal lands, is heightened. The fact that BLM does not regulate these state and private

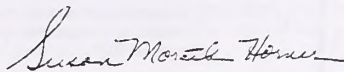


Bill McMahan  
June 16, 1995  
Page 11

13-18 lands is an exceedingly important factor in evaluation and approval of the project.  
Cont.

Thank you for the opportunity to comment on this proposal.

Sincerely yours,



Susan Morath Horner  
Staff Attorney

SMH:p

Comment Letter #14



United States Department of the Interior

BUREAU OF RECLAMATION  
Upper Colorado Regional Office  
125 South State Street, Room 6107  
Salt Lake City, Utah 84138-1102

IN REPLY REFER TO  
UC-751  
ENV-6.00

JUN 15 1995

MEMORANDUM

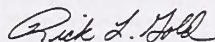
To: Mr. Bill McMahan, Project Coordinator, Bureau of Land Management,  
Rock Springs District Office, P.O. Box 1869,  
Rock Springs WY 82902-1869

From: Charles A. Calhoun  
Acting Regional Director

Subject: Region Review on the Draft Environmental Impact Statement - Expanded  
Moxa Arch Area Natural Gas Development Project

We appreciate the opportunity to review and comment on the above document. We commend the manner in which the document was prepared. The general and specific comments we have are attached.

If there are any questions or if we can be of further assistance, please contact Ms. Jacqueline Murphy, UC-751, at (801) 524-6292, extension 5.



Attachments 2

Comments on the Moxa Arch EIS.

General Comments:

1. The DEIS states Reclamation is a NEPA defined cooperating agency for this document. It seems the Salt Lake City and Provo Offices of Reclamation have no documentation stipulating the same.
2. We can find no one in the Salt Lake City or Provo Offices of Reclamation who remember being approached to consult on this document and Reclamation was not included as part of the interdisciplinary team as a coordinating agency should be.
3. We could not find information on neither Indian Trust Assets nor Environmental Justice in this document.
4. We can not find where Reclamation guidelines for Dam and Reservoir safety have included in this document.
5. This DEIS came to us twice, causing some problems and most importantly, losing us much time for the review process. Please use the regular NEPA compliance channels for review and comments.

14-1

Specific Comments:

- 14-2 1. Page 2-1, column 2, paragraph 1: The DEIS proposes an increase activity over the next ten years. Drilling will occur in the Fontenelle Dam and Reservoir area (see Exhibit 2-1). From a dam safety standpoint, we must insist that our requirements for drilling in the proximity of our dam and reservoir be adhered to. Directional drilling under our dam cannot be allowed.
- 14-3 2. Page 3-19, column 1, paragraph 4: The water resources section fails to address or even acknowledge the presences of Fontenelle Dam and reservoir.
- 14-4 3. Page 3-26, column 2, paragraph 3: It is stated that well drilling has the potential for causing cross contamination of aquifers. It also states "No conclusions have been reached at this time in regard to the occurrence of mixing and potential groundwater contamination." Yet, page 4-33, column 1, paragraph 2, addresses the consequences of these actions. These guidelines appear to leave a lot to be desired. There seems to be no real way to determine if contamination has occurred or is occurring. More studies need to be done in this area.
- 14-5 4. Page 4-29, column 1, paragraph 2: Again no mention of Fontenelle and the potential impacts to the Dam and Reservoir. The Reservoir can be impacted by both surface and ground water which feed into it, as well as run-off and sedimentation from drilling. None of these actions have been evaluated with respect to the Dam and Reservoir.
- 14-6 5. Page 4-29, column 2, paragraph 2: Reclamation criteria for safety of dams and Reservoir protection are not represented in the Impact Significance Criteria.
- 14-7 6. Page 4-33, column 2, paragraph 2: Casing corrosion presents a potential long-term problem that is only partially addressed by cathodic inhibitors. The inhibitors will slow down the corrosion process but not eliminate it.
- 14-8 7. Page 5-2, column 2, paragraph 4: The monitoring and mitigation necessary for the safety of the Dam, the Reservoir, the wetlands and vegetation around the Dam and reservoir areas are not presented here.
8. Page A-6: These stipulations are for surface use only. Stipulation for drilling are not included here.



Comment Letter #15

STATE OF WYOMING  
OFFICE OF THE GOVERNOR

JIM GERINGER  
GOVERNOR

June 14, 1995

STATE CAPITOL BUILDING  
CHEYENNE, WY 82002

Bureau of Land Management  
Bill McMahan, Project Coordinator  
P.O. Box 1869  
Rock Springs, WY 82902-1869

Dear Mr. McMahan:

Enclosed you will find comments from various state agencies regarding the Environmental Impact Statement on the Expanded Moxa Arch Area Natural Gas Development Project. I trust you will give them every appropriate consideration.

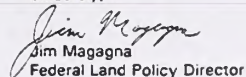
15-1 The State of Wyoming strongly supports the proposed action and thus encourages this project to move forward. It is consistent with our desire to foster the growth of the gas industry in Western Wyoming.

Development of this scope presents management challenges to maintain viable multiple use. There is a need for a strong commitment by both the Bureau of Land Management and the industry to reasonable mitigation measures especially as applicable to wildlife habitat.

15-2 The United States Forest Service has recently expressed to us their concern with the potential impacts of this development on air quality and acid deposition on lakes within the Bridger Wilderness. Wyoming will be undertaking an effort to quantify the amount of air quality degradation being caused by in-state activities versus that being carried into the state. Your efforts in monitoring and in providing reliable data on the air quality impacts of this and similar projects will be beneficial to us as we proceed.

I appreciate the opportunity to forward these remarks to you and to participate in the process.

Sincerely,



Jim Magagna  
Federal Land Policy Director

JM:jh  
Enclosures

INTERNET GOVERNOR@WYDPROD.STATE.WY.US • TELEPHONE (307) 777-7434 • FAX (307) 632-3909



Comment Letter #16  
 State of Wyoming  
 Oil and Gas Conservation Commission

GOVERNOR JIM GERINGER, CHAIRMAN  
 COMMISSIONERS  
 JIM MAGAGNA GARY B. GLASS BILL CROUCH ELMER S. PARSON  
 STATE OIL AND GAS SUPERVISOR  
 DONALD B. BASKO

Ms. Julie Hamilton  
 The Governor's Office  
 State Capitol Building  
 Cheyenne, WY 82002

RE: Draft Environmental Impact Statement,  
 Expanded Moxa Arch Area, Natural Gas  
 Development Project, State Identification  
 92-073

Dear Ms. Hamilton:

The Moxa Field was discovered in 1961 and has undergone development ever since. A number of other fields have been developed into what is now known as the Greater Moxa Arch. The geologic feature itself extends from the Utah-Wyoming border North past almost all the producing fields far into the Basin.

At the present time, there are hundreds of wells in this trend. The total number of gas wells in the whole state as of January 1995, was 4,071, an increase of 1,400 wells in four years. The vast majority of these are located on or near the Moxa Arch area.

Since there is already an extensive road and gathering system in place, it makes sense to develop these additional reserves. The state needs the tax revenues generated by this activity and the nation needs the gas.

On page 3-8, the statement is made that approximately 321 wells exist in 15 fields within the study area. Our records indicate that as of the end of 1993 628 wells were in existence in the same area. That figure is certainly considerably larger today what with all the drilling that has taken place in the last year and a half.

It is obvious that the Moxa Arch area is a world class gas province insofar as the reserves are concerned and should be developed in an orderly fashion. The U.S. Geological Survey estimates that Wyoming has a potential of 176.3 trillion cubic feet of reserves. The majority of that lies in the Greater Green River Basin. The figure of 1,325 wells over ten years should not create any environmental hardships for anyone.

Very truly yours,

*Donald B. Basko*  
 Donald B. Basko,  
 State Oil and Gas Supervisor

DEB/d1

777 WEST FIRST STREET, P.O. BOX 2640, CASPER, WYOMING 82602 (307) 234-7147 FAX (307) 234-5306

Comment Letter #17



JIM GERINGER  
 GOVERNOR

Department of Environmental Quality

Herschler Building • 122 West 25th Street • Cheyenne, Wyoming 82002

|  |   |   |   |  |   |   |
|--|---|---|---|--|---|---|
| ADMINISTRATION<br>(307) 777-7758<br>FAX 777-7662 | ABANDONED MINES<br>(307) 777-6145<br>FAX 634-0799 | AIR QUALITY<br>(307) 777-7391<br>FAX 777-7662 | INDUSTRIAL SITING<br>(307) 777-7368<br>FAX 777-6937 | LAND QUALITY<br>(307) 777-7756<br>FAX 634-0799 | SOLID & HAZARDOUS WASTE<br>(307) 777-7752<br>FAX 777-5973 | WATER QUALITY<br>(307) 777-7781<br>FAX 777-5973 |
|--|---|---|---|--|---|---|

June 9, 1995

Mr. Bill McMahan  
 Bureau of Land Management  
 Rock Springs District Office  
 P.O. Box 1869  
 Rock Springs, Wyoming 82902-1869

RE: Draft EIS, Expanded Moxa Arch Area Natural Gas Development Project

Dear Mr. McMahan:

Phil Ogle of the Water Quality Division (WQD) reviewed the above referenced Environmental Impact Statement (EIS) and provided comments which are presented below. Thank you for the opportunity to comment.

Production

The proposed production and facility construction operations provide an excellent approach to protect water quality.

Section 2.2.4.2.6 Water Resources

17-1 Measure 11 page 2-35, discusses construction and lining of reserve pits. This measure should include language from page 2-6 and/or page 4-32 that further describes the circumstances in which reserve pits would be lined.

17-2 Measure 14 page 2-35: All discharges of hydrostatic test water must be coordinated with WQD as well as SEO and BLM. If additional information is required, please contact Marisa Latady at 307-777-7781.

Mr. Bill McMahan  
 June 9, 1995  
 Page 2

Measure 16 page 2-35: The statement "(t)he WDEQ requires Operators to obtain a field permit for fields of 20 wells or more" is incorrect. Generally, entire fields will not be covered by one notification of intent and a single Pollution Prevention Plan (PPP). This policy means that each well and associated facilities (roads, pipelines, reserve pit, etc.) that disturb five acres or more must be covered under the permit separately. However, at the request of the operators WQD has modified the policy such that a company participating in a field development can either follow the general policy of single well permitting or file notification for coverage of all their wells within the field. The following criteria must be met to obtain full field coverage:

17-3

1. The company must have 20 or more wells proposed for the field development. A listing of all the proposed wells, which includes the legal locations, must be submitted to WQD.
2. A PPP must be prepared that describes the characteristics of the field, the specifics of each individual well site, and all erosion, sediment and storm water management practices that will be utilized at each site. Before coverage under the general permit is issued by WQD a PPP for a selected site must be submitted and approved.
3. All wells in the field will be subject to the permit requirements, including those that disturb less than five acres.

Questions regarding coverage under the general storm water permit should be directed to Leah Krafft, WQD, Cheyenne, 307-777-7781.

Sincerely,

*Dennis Hemmer*  
 Dennis Hemmer, Director  
 Department of Environmental Quality

DH/PO/jn - 52442.ltr

cc: File 94/92-073  
 Mary Adamy

Comment Letter #18



JIM GERINGER  
 GOVERNOR

Department of Environmental Quality

Herschler Building • 122 West 25th Street • Cheyenne, Wyoming 82002

|  |   |   |   |  |   |   |
|--|---|---|---|--|---|---|
| ADMINISTRATION<br>(307) 777-7758<br>FAX 777-7662 | ABANDONED MINES<br>(307) 777-6145<br>FAX 634-0799 | AIR QUALITY<br>(307) 777-7391<br>FAX 777-7662 | INDUSTRIAL SITING<br>(307) 777-7368<br>FAX 777-6937 | LAND QUALITY<br>(307) 777-7756<br>FAX 634-0799 | SOLID & HAZARDOUS WASTE<br>(307) 777-7752<br>FAX 777-5973 | WATER QUALITY<br>(307) 777-7781<br>FAX 777-5973 |
|--|---|---|---|--|---|---|

June 5, 1995

Bill McMahan, Project Coordinator  
 U.S. Bureau of Land Management  
 P.O. Box 1869  
 Rock Springs, WY 82902-1869

RE: Moxa Arch and Fontenelle Draft Environmental Impact Statements

Dear Mr. McMahan:

The Department of Environmental Quality has reviewed the Draft Environmental Impact Statements for the Moxa Arch Area Natural Gas Development and Fontenelle Natural Gas Infill Drilling Projects and our comments are provided on the enclosed attachments. These comments have been informally provided to you previously through our District Engineer.

Thank you for the opportunity to comment on the Draft Environmental Impact Statements and we look forward to working you to ensure the environmentally sound development of the proposed project areas. Should you have any questions, please do not hesitate to contact our office.

Sincerely,

*Dennis Hemmer*  
 Dennis Hemmer  
 Director

DH/bg  
 Enclosures  
 cc: Charles Collins  
 Lee Gribovicz



Moxa Arch Natural Gas DEIS Comments

General Comments

The DEIS makes the assumption that the only significant air quality concerns are present during the drilling and well development stage of the project, while assuming that long term production related emissions from the operations are negligible. I find that this assumption is incorrect.

The cumulative emissions from wellfield compression, natural gas dehydration, condensate liquids handling, and other gas/liquids processing are significant. The impact of these emissions on the Moxa Arch area is currently unquantified.

Emission sources in the oil and gas industry emit traditional criteria pollutants (TSP, PM-10, SO<sub>2</sub>, NO<sub>x</sub>, CO and VOC) in significant amounts. NO<sub>x</sub> is one of the main pollutants from oil and gas operations. Recent Air Quality Division emission inventories have placed the Moxa Arch area permitted emission totals at over 27,000 TPY. Of that, about 3,000 TPY is related to existing oil and gas operations in the Moxa Arch area with the balance being other area industry, primarily soda ash processing.

18-1 There is not a conveniently compiled emission number for CO, another of the chief pollutants from oil and gas operations. However, there are currently no significant air quality concerns with ambient CO concentrations in Southwest Wyoming.

The emission of hydrocarbons and related Volatile Organic Compounds from oil and gas operations is also poorly quantified at this point in time, but there could be significant emissions of these compounds that are not on the State's emission inventory at this time. The Air Quality Division does not currently have indications of general exceedances of standards from any of the criteria pollutants in the Moxa Arch area, but there is interest in evaluating the oil and gas emission totals/impact from NO<sub>x</sub> and VOC for other reasons.

Currently, the State of Wyoming is involved with a coalition of business and public interest groups in an attempt to quantify visibility and related impairment in the Green River Basin of Southwest Wyoming. Oil and gas emissions of NO<sub>x</sub> and VOC's figure prominently in the evaluation of this issue.

In addition, Title III of the 1990 Amendments to the U.S. Clean Air Act has listed 189 Hazardous Air Pollutants (HAP's) which must now be more carefully considered in air quality evaluations. Preliminary evaluation of the oil and gas industry's emissions show that there are at least five compounds that are on this list of HAP's including; benzene, ethylbenzene, toluene, xylene and hexane. There is currently very poor quantification of the emission rates for these HAP compounds and the Moxa Arch DEIS fails to consider the emission of these pollutants in any fashion.

18-1 Cont. In summary, the DEIS should be revised to include a complete evaluation of the air quality impact from both the drilling/development phase of the operations ...and... from the long term production phase of the operation. Also, total impact of NO<sub>x</sub>, CO, VOC's and HAP's should be considered along with the cumulative impact of other industrial emissions of the Moxa Arch Region.

Specific Comments

Page S-3, Section S.22:

18-2 This paragraph states that construction and operation of additional well sites in the Moxa Arch area would not have a significant air quality impact on the area. I do not find that all emissions have been considered and I disagree that the cumulative air quality impact has been adequately demonstrated.

Page 1-15, Table 1-4:

18-3 This table lists Wyoming Department of Environmental Quality Authorizing Actions. Missing from this table is Air Quality Division permitting/approval for compression sites, flaring, and other natural gas production and processing facilities.

Page 2-31, Section 2.2.3.4:

18-4 This section notes that additional gas compressor/treatment facilities would be required and cites one additional compressor station planned for construction and operation in the Moxa Arch area. This is almost certainly not the total additional compression, production and processing facilities that will be required due to the expanded drilling conceived under the Proposed Action and Alternative A of this DEIS.

Page 2-33, Section 2.2.4.2.2:

18-5 This section correctly notes that Operators will not burn open garbage or refuse at their Moxa Arch operations. It should be made clear that the Air Quality Division policy prohibits open burning of commercial garbage in the State of Wyoming and any other open burning falls under permitting provisions of Section 13 of the Wyoming Air Quality Standards & Regulations.

18-6 The section also notes that fugitive dust emissions will be controlled by application of dust suppressant, but Section 14 of Wyoming regulations goes on to specify control to the extent that ambient air quality standards are not exceeded.

Page 2-42, Table 2-5:

18-7 This table has a "Resource Element" entitled "Emission Rates per Well (µg/m³)." The table

18-7 Cont.

then goes on to list ambient air quality impact concentrations. It is hard to see how an "emission rate per well" is presented in terms of an ambient concentration, and it is misleading when the table does not clarify whether these "concentrations per well" are cumulative (ie/ 4.94 µg/m³ PM-10 per well implies over 6000 µg/m³ for the 1325 well proposed action????). It appears that the "Resource Element" title is in error.

Page 3-4, Section 3.2.2:

18-8

This paragraph states that the nearest "non-attainment area" in proximity of the Moxa Arch analysis area is the trona industrial area and the section states that this area is non-attainment for secondary PM-10 standards. The trona area is not a current non-attainment area.

Page 3-6, Table 3-3:

18-9

This table lists the National Primary Annual PM-10 standard as 5 µg/m³. This listing is in error and should be 50 µg/m³.

Page 4-4, Section 4.2.1:

The second paragraph of this section compares the "construction phase" of natural gas wellfield development against the "production phase" of the operation and states that "the first phase is by far the larger emitter of air pollutants due to is construction vehicle traffic, drilling rig emissions, and gas flaring". The paragraph goes on to say that "Therefore, air quality impacts from only the construction phase are examined in this chapter."

18-10

As noted in my general comments, this is incorrect. For the emission of TSP and PM-10 pollutants, construction related and vehicular traffic most likely will be the greater emission phase. These are ground based emissions which should be controlled by the BLM's requirement for the use of chemical dust suppressants during drilling activity and should not cause significant air quality concern.

For NO<sub>x</sub>, CO, VOC and HAP emissions, however, this statement is not clearly true. I can find no discussions of the generator sizes and other fired equipment required for a standard drilling rig in the Section 2.2 description of the Proposed Action. On the production side, I can find nowhere that the BLM has estimated the amount of increased wellfield compression, wellsite production equipment (including fired point emission sources such as heater/treaters, line heaters and dehydrator heaters), or central gas processing facilities necessary to support the proposed level of wellfield development. Also, there is no estimate of hydrocarbon and HAP emissions due to dehydrator reboiler vents, process line leaks, liquid storage tank vents, and other such production related emission sources. In particular, there is no estimate of the contribution of fugitive emissions from the wellfield activity, which the Air Quality Division has found can be on the order of 1000's of TPY for the Moxa Arch area. Thus one is unable to compare the emissions from construction related drilling activities and long term production related emissions.

Page 4-6, Table 4-1:

The basis for these emission estimates is not given, therefore one cannot verify the accuracy of the estimates.

18-10 Cont.

Given that 1325 wells would be drilled over 10 years, there would be 132.5 wells per year established. Thus according to your estimates of the emission rates predicted per wellsite, during the construction phase there will be annual emissions of:

|                 |           |
|-----------------|-----------|
| PM-10           | 828 TPY   |
| VOC's           | 150 TPY   |
| CO              | 310 TPY   |
| NO <sub>x</sub> | 4,284 TPY |
| SO <sub>2</sub> | 237 TPY   |

Even without accounting for long term production related emissions, these are significant annual emission totals from the drilling program.

Page 4-6, Section 4.2.3.2 and Table 4-2:

18-11

In addition to the above predicted construction related emissions, there will be wells coming into the production phase during each of the 10 years considered in this DEIS. Because the emissions from the drilling program will thus overlap with a portion of the long term production related emissions, the impact analysis summarized in this section is deficient because it does not consider the maximum emission case.

Page 4-7, Section 4.2.3.3:

18-12

In considering the affect on Air Quality Related Values (AQRV's), the analysis of the impact on visibility is inadequate. As with ambient impact concentrations, one cannot predict the impact to visibility unless the maximum potential emission rate is considered. Therefore, because this DEIS does not consider all emissions, the total impact on visibility is not complete. The same comment can be applied to the acid deposition impact.

Page 4-9, Section 4.2.5:

18-13

This section states that the [wellfield drilling construction phase] impact from individual well sites will not overlap. This cannot be shown to be true until the full impact from each individual well site is evaluated for both the construction phase and the production phase of the wellfield operation, along with an apportionment of the necessary ancillary compression, production and gas processing facilities required for the full considered development. This must be done for all potential emissions, including HAP's. Thus, the cumulative impact has not been demonstrated.





Comment Letter #19  
Department of Commerce  
Celeste Colgan, Director

THE STATE OF WYOMING  
Jim Geringer, Governor

Division of Cultural Resources

Ms. Julie Hamilton  
May 17, 1995  
Page 2 - EIS 6425.1

May 24, 1995

Mr. Bill McMahan,  
Project Coordinator  
Rock Springs District - SLM  
P.O. Box 1869  
Rock Springs, WY 82902

RE: Draft Environmental Impact Statement on the Expanded Moxa Arch Area  
Natural Gas Development Project; SHPO #0394KLK035

Dear Mr. McMahan:

Staff of the Wyoming State Historic Preservation Office have reviewed the above referenced Draft EIS as it pertains to cultural resources. The discussion is comprehensive and well done. We look forward to reviewing the forthcoming document that synthesizes the extent cultural resource database from the Moxa analysis area. Further comments on effects to archaeological and historic sites will be provided when we review the proposed programmatic agreement which will delineate the process of managing cultural resources in the analysis area.

Please refer to SHPO project control number #0394KLK035 on any future correspondence dealing with this project. If you have any questions contact Judy Wolf, Deputy SHPO, at 307-777-6311.

Sincerely,

*John T. Keck*

John T. Keck  
State Historic Preservation Officer

JTK:jkw:rtw

cc: Wyoming State Clearinghouse, Office of the Governor, State Capitol Building, Cheyenne, WY 82001

wells), and "no action." The "no action" alternative would continue existing production activities, but no further natural gas development would be authorized on federal lands. Our comments follow:

20-1

1. RE: Analysis Methods. Effects of human activity on pronghorn populations are not well understood. Although the EIS citation of Reeve (1989) states, "Antelope will acclimate to increased traffic volumes and machinery as long as machinery moves in a predictable manner," there is no data suggesting field development will meet these criteria or that the large amount of disturbance will not be detrimental. In fact, Reeve (1995) also suggests cumulative impacts from oil and gas may significantly impact habitat use by antelope. We believe the analytical methods used in the Fontenelle EIS are more meaningful and should be applied to Moxa Arch. The current analysis is largely based on opinions, which fail to support its conclusions. REF: 40 CFR 1500.1; 40 CFR 1501.2(b); 40 CFR 1502.1; and 40 CFR 1502.24.

20-2

2. RE: Impact Significance Criteria (Page 4-44). "Threshold of significance" criteria should not be used to define whether mitigation is needed. Agencies are required to use all practicable means to mitigate potential adverse effects upon the human environment [40 CFR 1500.2(f)]. BLM should define actual projects to mitigate wildlife impacts and include them in the FEIS in a format that assures implementation. Examples of viable projects include range treatments (burning, chaining, etc), dismantling or modifying problem fences, retiring allotments or AUMs, developing new water sources (outside crucial winter ranges), riparian fencing, reclamation of abandoned disturbances, road closures, negotiation of conservation or access easements, etc.

20-3

3. RE: WGFD Population Objectives (Page 4-44). Impact significance should not be based on the ability to meet WGFD population objectives. These are held at socially determined levels beneath the carrying capacity. Extensive damage to important habitats can occur before population reductions may signal a problem. The NEPA analysis should address impacts to the population carrying capacity of the area. Project-related mortality and habitat losses can reduce the harvestable surplus of animals and remove options for increasing the population objective in the future. This is a significant adverse impact to hunters and the Department. Loss of existing habitat also more rigidly ties

19-1

State Historic Preservation Office  
Barrett Building, 4th Floor, 2301 Central Avenue, Cheyenne, Wyoming 82002  
(307) 777-7699 FAX (307) 777-6421

WYOMING  
GAME AND FISH DEPARTMENT



May 17, 1995

Comment Letter #20

RECEIVED

MAY 19 1995

GOVERNMENT OFFICE

Ms. Julie Hamilton  
May 17, 1995  
Page 3 - EIS 6425.1

20-3

Cont.

the herd to remnant, unaffected habitats, increasing its vulnerability to future development actions. This loss of "elasticity" is a very undesirable effect.

20-4

4. RE: Cumulative impacts. The draft EIS contains a thorough analysis of cumulative wildlife impacts within the Moxa Arch field. However, regional cumulative impacts have not been considered. Other proposed developments (e.g. Fontenelle In-fill drilling) will result in big game habitat loss within the same herd units affected by the Moxa Arch field. The analysis needs to address all previous, existing, and future cultural modifications of the land (agricultural conversions, grazing, fences, roads and highways, railroads, urban developments, subdivisions, mining, other industrial developments, etc), and the addition of oil and gas impacts to these. REF: 40 CFR 1502.16 (a) and (b); 40 CFR 1508.8; 40 CFR 1508.7; and 40 CFR 1508.27.

20-5

5. RE: Mitigation of Impacts to Public Resources (Sec 4.9.6, Page 4-65). BLM makes the statement, "Mitigation identified, although desirable, can only be required or enforced on BLM-administered lands." This statement is misleading. Federal agencies are required to use all practicable means to minimize adverse effects of their actions [40 CFR 1500.2; 40 CFR 1502.14(f); and 40 CFR 1502.16(h)]. 40 CFR 1502.3 stipulates, "... Mitigation and other conditions established in the environmental impact statement or during its review and committed as part of the decision shall be implemented by the lead agency or other appropriate consulting agency. The lead agency shall ... include appropriate conditions in grants, permits or other approvals."

If impacts of the proposed action are anticipated on private or federal lands, then project proponents (and the lead agency) should negotiate mitigation agreements which can be reliably executed and therefore, affirmatively support the decision. Mitigation agreements can be with the private landowner or, if that individual is not receptive, mitigation can be relocated to other suitable federal, state, or private surfaces. NEPA requires use of all practicable means to mitigate. Negotiation of mitigation strategies for inclusion in the NEPA document is one practicable method of accomplishing mitigation. The option of relocating mitigation to public land always exists. We request BLM provide a plan to mitigate wildlife impacts on

WYOMING STATE CLEARINGHOUSE  
ATTN: JULIE L. HAMILTON  
OFFICE OF THE GOVERNOR  
STATE CAPITOL BUILDING  
CHEYENNE, WY 82001

Dear Ms. Hamilton:

The staff of the Wyoming Game and Fish Department has reviewed the draft environmental impact statement for the expanded Moxa Arch Area Natural Gas Development project on the Kemmerer Resource Area. We offer the following comments for your consideration pursuant to the National Environmental Policy Act.

Terrestrial Considerations:

The operators have proposed to infill drill approximately 1,325 additional wells during the next 10 years. The field will also expand north and south. The analysis area encompasses 476,261 acres (T15-23N, R110-113W), in Sweetwater, Lincoln, and Uinta counties.

Of the 1325 proposed wells, 610 will be located within the "core" production area (proved reserves), and the remaining 715 will be drilled in "flank" areas (areas where reserves are unproven). Development is not expected to exceed 4 wells per section.

Three alternatives have been analyzed. They include the proposed action (1325 wells), a reduced number of wells (795



Ms. Julie Hamilton  
 May 17, 1995  
 Page 4 - EIS 6425.1

20-5  
 Cont.

both public and private land, in executable format within the FEIS.

20-6

6. RE: Off-Site mitigation. Considering the density of wells and other facilities proposed, the only reasonable mitigation alternatives are off site. For example, if antelope are displaced from the Moxa Arch area and move north of Highway 189, the area would need to be enhanced to support increased use by antelope. Such displacement may also damage deer winter range and private property. We agree with the statement, losses of crucial winter range "... are serious and would make the achievement of WGFD objectives more difficult and challenging" (Page 4-61). Any loss of crucial winter range, and any reduction in habitat effectiveness should be replaced or mitigated.

20-7

7. RE: Page 4-61 and Table 4.13 (Reductions in Carrying Capacity). The DEIS acknowledges there will be permanent or long term reductions in carrying capacity of affected pronghorn herd units. BLM should define executable mitigation programs that will maintain carrying capacities as they currently exist.

20-8

8. RE: Section 4.9.6.4 (Prohibition of General Hunting). The Moxa Arch field extends throughout substantial public land within a popular hunt area. Section 4.9.6.4 of the draft EIS indicates unsupervised rifle hunting within the well field may need to be prohibited for safety reasons. This is inconsistent with multiple use management. We have received numerous complaints from sportsmen about existing well densities and oil and gas activity in several areas. We believe the hunting public will take great exception to a ban on general hunting.

BLM should explain how this alternative will attain the widest range of beneficial uses without degradation or other undesirable or unintended consequences [40 CFR 1502.2(d) and Sec 101(b)(3)]. Physical alterations which impact the capability of an area to support traditional recreation, including hunting, are an impact to the quality of the human environment [40 CFR 1500.2(e) and [40 CFR 1508.14]. We recommend the BLM identify specific alternatives with siting, spacing, sequencing, structure types, or compartmentalized development that maintain the area's suitability for hunting and shooting with high-powered rifles. The Department believes oil and gas fields should

Ms. Julie Hamilton  
 May 17, 1995  
 Page 5 - EIS 6425.1

20-8  
 Cont.

be developed in a manner which preserves the integrity of public lands to support all legitimate forms of public recreation.

20-9

9. RE: Mitigation of Impacts to Recreation. The DEIS states, "the area provides excellent pronghorn hunting opportunities ... and mule deer in the area are hunted in October" (page 3-73). If hunting is prohibited or restricted, BLM should develop suitable mitigation (e.g., develop public access to an equivalent area of previously inaccessible land within the same herd unit(s), where hunting with high-powered rifles is permitted).

20-10

10. RE: Reclamation. Past construction in the Moxa Arch Field has impacted 25,999 acres. Long-term facilities remain on 12,034 acres. Under the proposed action, 20,293 acres would be excavated to construct additional facilities. Long term disturbance would remain on 5,691 acres. The total area excavated would become 46,292 acres and long term facilities will remain on 17,725 acres. Habitat effectiveness will be reduced over larger areas by proximity of structures, noise, dust, and human and equipment activity. The analysis presumes reclamation reduces the affected area. However, reclaimed sites will not produce similar pretreatment vegetation for approximately 20 years if successful (or longer if unsuccessful). BLM should comment on the length of time required for native shrubs and other species to reestablish and should consider this in the analysis.

20-11

11. RE: Mitigation of Impacts to Crucial Winter Ranges. Existing and proposed natural gas development at Moxa Arch will excavate at least 18,777 acres of pronghorn crucial winter range in the West Green River, Carter Lease, and Uinta-Cedar Mountain Herd Units (Table 4-12). Even after reclamation, long-term disturbance will remain on 16,756 acres. Habitat effectiveness will be lowered over broader areas of crucial range due to displacement and disruption of movement patterns.

Mitigation [40 C.F.R. 1508.20] includes not only reducing the magnitude of the effect, but also rectifying the impact by repairing, rehabilitating or restoring the affected environment, and compensating for the impact by replacing or providing substitute resources or environments. WGFD mitigation policy places crucial winter range in the "vital" category. The Department is directed by the Commission to

Ms. Julie Hamilton  
 May 17, 1995  
 Page 6 - EIS 6425.1

20-11  
 Cont.

recommend no loss of habitat function. We recommend BLM identify resource protection alternatives and mitigation procedures which preserve or replace habitat function within the herd units affected. Mitigation can be accomplished both on and off site, as appropriate, to best meet the needs of the population. Mitigation procedures should be defined by the FEIS in specific and executable format. REF: 40 CFR 1500.2 (e); 40 CFR 1500.2; 40 CFR 1502.14(f); 40 CFR 1502.16(h); and 40 CFR 1502.3.

20-12

12. RE: Mitigation Funding. Replacement of lost habitat values is not easily accomplished. The Moxa Arch mitigation committee is exploring ways to improve reclamation and develop habitat treatments that may benefit wildlife. Serious commitments of funding and manpower will be essential to develop successful and effective mitigation. We recommend the FEIS address this issue.

20-13

13. RE: Best Management Practices. Industry is currently making a good effort to reclaim disturbances. Tailoring seed mixes to specific site conditions is a positive step. However, we believe much more could be done. BLM should develop "best management practices" specifically for oil and gas development, to assure adequate resource protection, reclamation, and mitigation are accomplished. We suggest BLM also develop reclamation performance criteria and implement a compliance monitoring program. Additional, long-term monitoring should be done to establish whether current practices are producing desired results and if needed, to make adjustments.

20-14

14. RE: Reclamation Technology Forum. It may be appropriate for the BLM to sponsor a reclamation workshop, bringing experts and agency personnel together with companies in the Moxa Arch area, to evaluate current technologies and to exchange information. Since 46,000 acres must ultimately be reclaimed at the Moxa Arch fields, we believe technology exchange should become a priority.

20-15

15. Much of the language which describes mitigation is vague. The EIS generally fails to assign who is specifically responsible or who will fund projects. Examples can be found in Sections 5.2.6; 4.9.3.2.2; 4.9.6.4; and many other places in the document. We are concerned many items will never be accomplished without more concrete direction.

Ms. Julie Hamilton  
 May 17, 1995  
 Page 7 - EIS 6425.1

Aquatic Considerations:

Page 3-28. Channel catfish and rainbow trout should be added to the list of game species present in the Ham's Fork River. These species have been captured during our sampling efforts (1986) in the lower portion of this stream. Brown trout, lake trout, kokanee, mountain whitefish, and smallmouth bass should be added to the list of game species present in the Green River. The occurrence of largemouth bass in the lower Green River and Flaming Gorge Reservoir should be changed to smallmouth bass. Red shiner should be deleted from the list of nongame species.

20-16

Page 3-68. The information regarding flannelmouth suckers and roundtail chubs is insufficient. Viable populations of both these species, as well as bluehead suckers, are found in the Green, Hams Fork, and Blacks Fork rivers. Sampling conducted by our department in the Hams Fork and Blacks Fork at several sites near Granger in 1986, found good populations of all three of these species. In the Green River, roundtail chubs are less numerous but reproduction has been documented as recently as 1990. Flannelmouth suckers are common in the Green River between Fontenelle Dam and Flaming Gorge Reservoir. Bluehead suckers are found in the Green River.

The document states on page 3-23 that "streams in the analysis area are very sensitive to disturbance in the channel environment and to increases in surface runoff and/or tributary inflow and sediment." The document also says all streams have a moderate to very high sediment supply and streambank erosion potential is high to very high. We strongly agree with this assessment of the project area. Because the proposed action could result in cumulative impacts which could disturb nearly 10% of soils within the analysis area, the potential impacts to fisheries associated with sedimentation in rivers are a serious concern. To minimize the potential for negative fishery impacts, we urge the BLM to strictly enforce appropriate best management practices for impact avoidance, mitigation, monitoring and restoration measures.

Because of the fragile nature of the ephemeral and intermittent channels in the entire project area, long-term instability of the watersheds could result from noncompliance with BMP's on any part of the project area. In particular, impacts initiated on nonfederal lands could eventually extend to federal lands. Because of the sensitivity of this area, there



Ms. Julie Hamilton  
 May 17, 1995  
 Page 8 - EIS 6425.1

20-16  
 Cont.

may be no practical way to regain predevelopment conditions once erosion and downcutting begins in the watershed. To minimize the potential impact to federal lands and public fishery resources, it is critically important that the same mitigation measures and BMP's be applied to State and private lands within the project area as are required for federal lands.

Thank you for the opportunity to comment.

Sincerely,

*Joe White*  
 JOE WHITE  
 DEPUTY DIRECTOR

JW:TC:as  
 cc: Wildlife, Fish, HATS Divisions

Comment Letter #22



JIM GERINGER  
 GOVERNOR

Public Service Commission

700 W. 21ST STREET (307) 777-7427 CHEYENNE, WYOMING 82002  
 FAX (307) 777-5700  
 TTY (307) 777-7427

STEVE ELLENBECKER  
 CHAIRMAN  
 DOUG DOUGHTY  
 DEPUTY CHAIRMAN  
 BIL TUCKER  
 COMMISSIONER

STEPHEN G. OXLEY  
 ADMINISTRATOR  
 ALEX J. ELIOPoulos  
 CHIEF COUNSEL AND  
 COMMISSION SECRETARY

MEMORANDUM

TO: MS JULIE L. HAMILTON  
 POLICY ANALYST  
 GOVERNOR'S OFFICE

FROM: JON F. JACQUOT  
 ENGINEERING SUPERVISOR  
 PUBLIC SERVICE COMMISSION *Jon F. Jacquot*

DATE: MAY 10, 1995

RE: ENVIRONMENTAL IMPACT STATEMENT FOR THE EXPANDED MOXA  
 ARCH AREA NATURAL GAS DEVELOPMENT PROJECT, STATE  
 IDENTIFIER NO. 92-073

22-1

Thank you for the opportunity to comment on the referenced matter. The Commission requests that no unreasonable restrictions be placed on the provision of utility service or on the construction of utility and pipeline facilities as a result of the referenced plan.

The Commission requests that, in cases involving oil and gas leasing, the Bureau of Land Management not restrict the construction of utility and pipeline facilities necessary for the exploration and production of oil and gas.

If you should have any questions regarding this matter, please let me know.

Comment Letter #21



WYOMING STATE GEOLOGICAL SURVEY  
 BOX 3008, UNIVERSITY STATION • LARAMIE, WYOMING 82071-3008  
 (307) 766-2286 • FAX 307-766-2605

STATE GEOLOGIST - Gary B. Glass

GEOLOGICAL SURVEY BOARD  
 Ex Officio  
 Governor Jim Geringer Terry P. Boon  
 Donald B. Basso Gary B. Glass  
 Appointed  
 D. L. Backstone, Jr. Beverly D. Reed  
 Jimmy E. Gossett Nancy M. Dwyer  
 Victor B. Masturza

|  |   |                                |                                   |   |                               |                                      |
|--|---|--------------------------------|-----------------------------------|---|-------------------------------|--------------------------------------|
| SENIOR ECONOMIC GEOLOGIST (M&I) W. Don House | STAFF GEOLOGISTS - Coal P. Daniel Vogel | Geologic Hazards James C. Cole | Geologic Mapping Alan J. Van Pelt | Industrial Minerals/Uranium Roy E. Harris | Oil and Gas Rodney H. De Brun | PUBLICATIONS Editor Richard W. Jones |
|--|---|--------------------------------|-----------------------------------|---|-------------------------------|--------------------------------------|

May 15, 1995

- Memorandum -

TO: Julie Hamilton, Wyoming State Clearing House

FROM: Gary B. Glass, State Geologist

SUBJECT: Draft Environmental Impact Statement Expanded Moxa Arch Area, Natural Gas Development Project (State Identifier #92-073)

After a review of this document, we have the following comments:

First, I strongly endorse the Bureau of Land Management's Proposed Alternative, which allows continued development of this existing and important gas-producing area of Wyoming. The management strategies for this area will safeguard the environment while allowing needed development of these important reserves of natural gas.

21-1 A member of my staff noticed that the Rhone-Poulenc trona mine and refinery was not annotated on the map on page 3-11. He also noted that the trona mine and refinery within the study area is now Tg Soda Ash, not Texas Gulf.

In regard to seismic activity in this area, we think it is important to note that the area is in Seismic Zone 2B of the Uniform Building Code. This has particular importance in the construction of any "critical facilities" as defined by the Code.

21-2 Previous research indicates that an earthquake with a magnitude as large as 6.1 can occur in the area. In addition, the Rock Creek Fault, west of Fossil Butte National Monument, and the Bear Creek Fault System, southeast of Evanston, are both capable of generating magnitude 7.0 - 7.5 earthquakes. The Bear Creek Fault System may be at or beyond its expected recurrence interval. If faults in either of these areas activate, they could be felt as intensity VIII - IX ground motions in the Moxa arch area. This means ground accelerations could be on the order of 15 - 25% of gravity.

If you have any questions about our comments regarding the trona mines, please contact Ray Harris. You may contact Jim Case in regard to our comments on seismic activity.

GBG/sb

Serving Wyoming Since 1933

Comment Letter #23



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
 REGION VIII  
 999 18th STREET - SUITE 500  
 DENVER, COLORADO 80202-2466

Ref: 8WM-EA

JUN 29 1995

Bureau of Land Management  
 Bill McMahan, Project Coordinator  
 P.O. Box 1869  
 Rock Springs, Wyoming 82902-1869

Re: Draft Environmental Impact Statement for the Expanded Moxa Arch Area Natural Gas Development Project, Wyoming

Dear Mr. McMahan:

In accordance with the responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act (CAA), the Region VIII Office of the Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the above referenced project. EPA previously submitted comments to the BLM during the EIS scoping process (Robert DeSpain to Joseph Vessels, 5/2/94).

EPA commends the Bureau of Land Management (BLM) for the document's description of the proposed action and field-level of impact analysis. The air quality analysis was particularly well done in terms of addressing air quality impacts according to recommended modeling procedures from the Guideline on Air Quality Modeling.

23-1

As we have noted in comment letters to the BLM on other recent proposals for natural gas development in this area, we have continuing concerns that the regional cumulative impacts from this and numerous other proposed oil and gas activities in Southwestern Wyoming are not being adequately evaluated. Each individual project analysis has evaluated only incremental effects within its project boundary, which, when isolated from other large scale development activities, appear to have no significant impact. EPA believes that, cumulatively, the impact of oil and gas activity is significantly altering vast areas of Wyoming, which, if this pattern is left unchecked, may irreversibly exceed habitat thresholds for this fragile, arid ecosystem. To date, such effects have not been adequately analyzed. For example, this analysis does not consider the cumulative effects of the proposed Fontanelle natural gas development containing 1325 wells, which borders the Moxa Arch development. These large, similar, connected, and/or cumulative effects should be evaluated in the Final EIS.

23-2

We recognize that the BLM has committed to perform the Southwest Wyoming Resource Evaluation to consider the cumulative impacts associated with oil and gas development. Our concern is

Printed on Recycled Paper



2

23-2 Cont. that the proposed timing for completing the evaluation will not be useful to the deciding official for making decisions on current oil and gas development proposals.

In the near term, EPA strongly encourages the BLM to extensively use all available measures in the current proposals to reduce ground disturbance, including several discussed in the Moxa EIS, such as multi-well pad development and horizontal drilling. The recently released BLM Oil and Gas Performance Review Final Report (April 27, 1994) specifically proposed that royalty relief be provided to encourage drilling practices that cause minimal surface disturbance. EPA is encouraged that the Performance Review recommends Southwest Wyoming as an appropriate area to field test its conclusions.

23-3

We appreciate your recent discussion with Larry Kimmel to clarify aspects of the proposed development and offer to coordinate a site visit later this summer. We accept your invitation and look forward to the opportunity to gain a better understanding of the on-the-ground effects.

Listed below are EPA's remaining concerns for your consideration in preparing the Final EIS.

23-4 • Page S-5: Based on the relatively high percentage of sensitive soils in the development area (31%), past reclamation history (54% reclaimed), and lack of enforceability on nonfederal lands, the assumption for the Proposed Action and Alternative A to achieve 72% reclamation appears unrealistically high. What is the basis for that assumption?

23-5 • Page 2-23, Paragraph 5: The cementing policy for the Moxa Arch area appears to be too discretionary to achieve the stated objective "... to ensure protection of fresh water and other minerals during drilling and production phases of oil and gas wells". We recommend adherence to Requirement 1 (unless technically unfeasible): Production casing will be cemented from total depth (TD) back to surface or to 250 feet inside the surface casing. For exceptions to that requirement, EPA recommends that the use of corrosion inhibitor in the annular space be included in addition to other stated requirements.

23-6 • Page 2-35, Mitigation No. 10: "Case wells during drilling, and case and cement all wells in accordance with Onshore Order No. 2 to protect accessible high quality aquifers." Mitigation No. 10 defines high quality aquifers as those containing known water quality of 10,000 TDS (total dissolved solids) or less. For consistency, EPA recommends modifying Mitigation No. 10 from "protect accessible high quality aquifers" to "protect aquifers containing 10,000 TDS or less". The more explicit language is

3

23-6 Cont. consistent with the discussion of Onshore Order No. 2 on page 4-33, Paragraph 4: "Usable water is defined as groundwater with a total dissolved solids (TDS) content of 10,000 parts per million (ppm) or less encountered at any depth."

• Page 3-25, Table 8: The table of water quality data should indicate the derivation of the values displayed in terms of number of samples, range, means, and variance. The table should list applicable state water quality standards for reference.

In addition, the document should note that Section 319 of the Clean Water Act (CWA) requires States to identify nonpoint source threatened or water quality impaired streams and the sources and categories of pollutants affecting water quality; best management practices (BMPs); and to provide for a process of reviewing Federal activities to assure consistency of application and effectiveness of BMPs necessary to maintain or achieve water quality standards.

23-7 To supplement water quality information provided in the DEIS, we recommend that the BLM reference the Wyoming Department of Environmental Quality 303(d) list and 305(b) report. The Final EIS should summarize information from the references including water quality impaired or threatened stream segments, the pollutants of concern, the pollutant sources, and achievement of designated water uses. Such information is considered to be a key planning tool for assuring compliance with the Clean Water Act during site-specific project implementation.

23-8 • Page 3-33, Paragraph 1: The DEIS notes that 169 acres (3%) of wetlands have been disturbed in the past. The FEIS should address the level of disturbance (i.e., elimination?), whether the impacts were primarily related to oil and gas or other land use activities, and past mitigation requirements and effectiveness.

23-9 Given the scarcity of water resources in an arid ecosystem, EPA concurs with the intent stated on page B-2, "Avoidance of waters of the U.S. and wetlands should be the highest priority in the planning process." As indicated throughout the document, including the reclamation guidelines, the soil and climatic conditions, typical of the project area, may limit the ability to successfully mitigate disturbances. Therefore, EPA strongly recommends that the BLM require all practicable impact avoidance measures, and, for remaining impacts to waters of the U.S., that mitigation be required to replace unavoidably lost functions.

23-10 • Page 5-1 indicates that the BLM will specify in the Record of Decision (ROD) mitigation requirements that will apply on federal lands to reduce or eliminate adverse impacts. In support

4

23-10 Cont. of EIS conclusions of potential impacts related to development, we recommend that the language in the Final EIS for mitigation and monitoring and reclamation be as specific as possible to differentiate "requirements" from "guidelines".

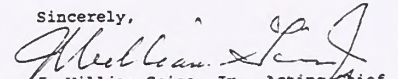
23-11 Because the area is described as having mixed ownership (55% federal, 45% private and State), the EIS commitment to mitigation states that impact avoidance can only be assured on federal lands. In order for mitigation efforts to be successful in a checkerboard land pattern, we encourage the BLM to obtain commitments from the Moxa operators to apply mitigation measures consistently on a field-wide basis.

23-12 • Page E-24 states that wetland revegetation should comprise no more than 15% of undesirable species. We are concerned that, in the types of soils described, the undesirable species may eventually dominate the revegetation area. To ensure more likely success for reclamation, we encourage requiring more stringent standards for undesirable species.

Based on the procedures EPA uses to evaluate the adequacy of the information in the EIS and the environmental impacts of the proposed action and alternatives, the subject Draft EIS will be listed in the Federal Register as category EC-2 (environmental concerns, insufficient information). This category indicates that EPA has identified areas of potential environmental impacts that should be avoided in order to fully protect the environment. Also, the EIS does not contain sufficient information to fully assess environmental impacts that should be avoided in order to fully protect the environment.

The EPA appreciates the opportunity to review and comment on the Draft EIS. If you may have any questions, please contact Larry Kimmel at (303) 293-1697.

Sincerely,

  
J. William Geise, Jr., Acting Chief  
Environmental Assessment Branch  
Water Management Division

cc: Bill Daniels, BLM Wyoming State Office, Cheyenne, WY







## SECTION 5: RESPONSE TO COMMENTS

### SECTION 5: RESPONSE TO COMMENTS

Comments received in response to the public hearing on the proposed rulemaking are summarized in the following table:

Comments received in response to the public hearing on the proposed rulemaking are summarized in the following table:

Comments received in response to the public hearing on the proposed rulemaking are summarized in the following table:

Comments received in response to the public hearing on the proposed rulemaking are summarized in the following table:

Comments received in response to the public hearing on the proposed rulemaking are summarized in the following table:

Comments received in response to the public hearing on the proposed rulemaking are summarized in the following table:

#### COMMENT 1

Comments received in response to the public hearing on the proposed rulemaking are summarized in the following table:

Comments received in response to the public hearing on the proposed rulemaking are summarized in the following table:

Comments received in response to the public hearing on the proposed rulemaking are summarized in the following table:

Comments received in response to the public hearing on the proposed rulemaking are summarized in the following table:

Comments received in response to the public hearing on the proposed rulemaking are summarized in the following table:

Comments received in response to the public hearing on the proposed rulemaking are summarized in the following table:

Comments received in response to the public hearing on the proposed rulemaking are summarized in the following table:

Comments received in response to the public hearing on the proposed rulemaking are summarized in the following table:

Comments received in response to the public hearing on the proposed rulemaking are summarized in the following table:



SECTION 2  
RESPONSE TO COMMENTS



## SECTION 5 - RESPONSE TO COMMENTS

Responses to comments are organized by responder and are numbered in the order received. Page and section numbers, unless otherwise noted, refer to the draft EIS issued in April, 1995.

### WYOMING ADVOCATES FOR ANIMALS

**Comment 1.1.** As with other uses of public lands, exploration and production of clean-burning natural gas is a valid use of public resources. BLM stipulates that this type of activity be done in an environmentally responsible manner. Wild horses do not exist in the expanded Moxa Arch area.

### OFFICE OF PLANNING AND DEVELOPMENT - LINCOLN COUNTY, WYOMING

**Comment 2.1.** BLM must complete the process required by the National Environmental Policy Act (NEPA) before a decision can be issued.

### LLOYD DORSEY

**Comment 3.1.** Yes, with implementation of either the Proposed Action or Alternative A, direct loss of habitat will occur as a result of surface disturbance during construction of oil and gas facilities. In addition, some wildlife species may be indirectly impacted because of displacement from habitats in the vicinity of construction activities due to the presence of humans. The severity of these impacts is expected to decrease once construction is completed. The wildlife impact analysis contained in the EIS is adequate to address these concerns and given implementation of the special avoidance and mitigation measures as described in Sections 2.2.4.2.6, 2.2.4.2.7, 4.10.4, 4.10.5, 5.2.4, and Appendices A and B, undue or unnecessary impacts to wildlife species can be avoided.

**Comment 3.2.** As noted in the DEIS, if 1,325 more wells and associated facilities are permitted, visual impacts, including potentially significant impacts within highway corridors I-80, US-189, and US-30 viewsheds, would persist throughout the life of the project. The operator(s) would be required to screen, paint, or take other measures to reduce visual impacts within the Class II, III, and IV areas (depending upon the classification status). Once activities are terminated, cleanup and final reclamation procedures would restore these areas in

compliance with Class II, III, or IV levels of visual contrast.

**Comment 3.3.** The DEIS concludes that implementation of the Proposed Action or Alternatives would adversely effect backcountry recreational experiences within the Moxa Arch area over the life of the project (30-50 years). Recreationists wanting complete solitude would need to find more suitable areas outside the project area. Construction of roads provides hunters and others with greater access into the area; however, the average hunter or recreationists is going to seek solitude elsewhere to hunt or recreate. BLM and BOR would require implementation of mitigation measures to minimize recreation impacts on federal lands. However, 45 percent of the Moxa Arch project area is comprised of private and state land (checkerboard land pattern) which would be developed with little regard for recreation values.

**Comment 3.4.** The BLM is responsible for the balanced management of the public lands and public resources, and their respective values so that they are considered in a combination that best serves the needs of the American people. Exploration and production of domestic energy sources is considered very important to the overall well-being of the American public and natural gas is the "energy of choice" because of its clean burning, low pollution properties. Operators must drill wells in areas where natural gas occurs but they are subject to many mitigation measures to protect other natural resources.

### U.S. DEPARTMENT OF AGRICULTURE - FOREST SERVICE - INTERMOUNTAIN REGION

**Comment 4.1.** The Final EISs for Fontenelle and Moxa Arch are modified to incorporate the appropriate level of cumulative air quality impact analysis, and includes well development for Moxa Arch, Fontenelle, Stagecoach Draw, Jonah Prospect, Greater Wamsutter, Mulligan Draw, Creston-Blue Gap, Dripping Rock, Hay Reservoir, and BTA Bravo proposed developments. The supplemental document entitled *Air Quality Cumulative Impact Analysis Technical Report Addendum* (Technical Support Document) has been prepared to examine the



## RESPONSE TO COMMENTS

---

cumulative impacts on air quality. See the Section 2 Addendum.

**Comment 4.2.** The BLM concurs that the cumulative impacts to air quality from natural gas development as proposed in the Expanded Moxa Arch Natural Gas development, the Fontenelle Natural Gas Infill Drilling development, Texaco's Stagecoach Draw Unit, and the McMurry's Jonah Prospect developments should be considered together. As noted in response 4.1, a supplemental cumulative air quality impact analysis has been completed. The analysis includes potential air quality cumulative impacts upon the Air Quality Related Values in the Bridger, Fitzpatrick, and Popo Agie Wilderness Areas. All appropriate measures identified to further mitigate impacts to air quality or that are subsequently required by the State of Wyoming Department of Environmental Quality-Air Quality Division, will be required as part of the Moxa Arch and Fontenelle Records of Decision and will also be applicable to Texaco's Stagecoach Draw and McMurry's Jonah Prospect projects and subsequent developments within the air quality analysis area.

**Comment 4.3.** The supplemental document entitled *Air Quality Cumulative Impact Analysis Technical Report Addendum* (Technical Support Document) has been prepared that examines the cumulative impacts on air quality of both the Moxa Arch and Fontenelle fields, and other developments such as Stagecoach and Jonah projects, existing power plants, trona plants, portions of the I-80 corridor, and railroad traffic. Emission sources which are not located in the Moxa Arch-Fontenelle-Stagecoach-Jonah area have also been included in the cumulative modeling effort (including Greater Wamsutter, Mulligan Draw, Creston-Blue Gap, Dripping Rock, Hay Reservoir, and BTA Bravo). A summary of the technical analysis conclusions is contained in Section 2 Addendum and Appendix A of this FEIS.

**Comment 4.4.** WDEQ, Air Quality Division, has provided more recent background concentration data collected at Seedskaadee National Wildlife Refuge and at Craven Creek Site (Memorandum from B. Dailey, Engineering Supervisor, to Mr. C. Collins, Administrator, WDEQ, September 22, 1995). These background data were used in the *Technical Support Document Addendum*.

**Comment 4.5.** The *Technical Support Document Addendum* considers the impacts of the production phase as well as field construction and drilling phases.

**Comment 4.6.** The *Technical Support Document Addendum* considers the effects of dehydration units, compressor engines, and other sources of emissions as appropriate.

**Comment 4.7.** The VISCREEN screening model computes plume/sky/terrain contrast. The VISCREEN model includes implicit assumptions about plume transport, chemical conversion, and light attenuation, all of which ensures that the computations are highly conservative. If a particular application fails the VISCREEN analysis, then users are advised to adopt a less conservative analysis, such as VISCREEN2 or PLUVUE. Use of VISCREEN is required by the EPA for all PSD sources which may impact Class I airsheds. The VISCREEN model is not appropriate for analyzing regional haze, nor does it claim to simulate regional haze.

**Comment 4.8.** The USFS should provide a copy of the model to BLM.

**Comment 4.9.** The *Technical Support Document Addendum* discusses opportunities to reduce NOx emissions.

**Comment 4.10.** The *Technical Support Document Addendum* addresses the affect upon the buffering capacity of the sensitive lakes in the Wind River Mountains. The analysis concludes that construction and operation impacts would be below applicable significance criteria for atmospheric deposition within the Bridger Wilderness. Computations of atmospheric deposition indicate that there would be no significant deterioration of water quality even under "worst case" emission scenarios.

### AMOCO PRODUCTION COMPANY

**Comment 5.1.** Detailed engineering, as described in Section 2.2.1, is revised to read as follows: "Following the on-site evaluation, the applicant would file the application which would include site-specific construction plans where necessary to describe the proposed development (i.e., drilling plans with casing/cementing program; surface use plan with



## RESPONSE TO COMMENTS

---

appropriate engineering design to adequately describe proposed construction, reclamation plans, etc.)." See Section 2 Errata.

**Comment 5.2.** Exhibit 2-4 provides a schematic of a typical partially reclaimed well pad. This is only a representation and each well site lay-out will be dependent upon site-specific conditions.

**Comment 5.3.** The text is modified to read "...and maintained as determined appropriate and agreed to by BLM and the operator at the time of the on-site evaluation." See Section 2 Errata.

**Comment 5.4.** The text is modified to read "When necessary, resource roads..." See Section 2 Errata.

**Comment 5.5.** The text is modified to read: "...the lead operator (the operator with the greater number of federal wells) will..." See Section 2 Errata.

**Comment 5.6.** Because the oil and gas industry has constructed and will continue to construct most of the roads in the analysis area and because 45 percent of the road network is within a "checkerboard" land ownership pattern, BLM and other landowners will rely on the operators to provide their road construction and road maintenance needs during transportation planning. Industry must be a cooperator in the management of the current and future road network in the Moxa Arch area if impacts to other resource values are to be mitigated.

*A Road Development Plan for the Moxa Arch Area* has been prepared for the Operators (prepared by the engineering consulting firm of D.R. Griffin and Associates, Inc.) in consultation with BLM. As it states under "Purpose", the Plan "... is intended by the Moxa Arch Operators as a commitment to a quality assurance/quality control program for the location, design, construction and maintenance of roads required for expansion of their operations on public lands within the Moxa Arch Area." The Plan details "... the procedures by which transportation planning, road design, construction and road maintenance will be conducted by Moxa Arch Operators to meet their operational needs and Bureau of Land Management requirements for roading standards, safety, and resource protection."

Moxa Arch Operators will utilize an extensive network of existing roads in the Moxa Arch Area, much of which is shared with other road users. The incremental infill development of the Moxa Arch field will follow the guidelines provided in the *Road Development Plan for the Moxa Arch Area*. Transportation planning would consist of the annual review of plans for development between the operator and BLM. The review would entail assessment of existing roads and how the planned incremental well development roads would tie-in to the existing network to ensure safety and protection of natural resource values. As individual APDs are then prepared for submission to BLM, and following on-site inspection, the application will address site-specific considerations relative to safety and environmental protection pertaining to access road location, design, construction and maintenance in accordance with the *Road Development Plan for the Moxa Arch Area*. Thus BLM intends that access road plans submitted as part of an APD be consistent with the *Road Development Plan for the Moxa Arch Area*. See Section 2 Errata and Appendix B of this FEIS.

The purpose of the Road Development Plan is to provide an instrument for mutual understanding and agreement for developing road networks that are safe and adequate for drilling and production operations while protecting other important resource values.

The development of the transportation plan is incremental and in progress. In the Moxa Arch field it includes "checkerboard" land ownership. The transportation plan is prepared by industry (Amoco being the lead for industry) with input from BLM and private landowners and the county engineer (for county roads). The transportation plan, among other things, will: 1) follow the Road Development Plan guidelines which provides the engineering and construction guidelines; 2) assess conflicts with existing infrastructure and other surface uses; 3) provide an accurate and current base map of the existing road network; 4) allow for annual modifications that reflect short-term development plans as drilling plans are finalized - but within the scope of the Road Development Plan; and 5) specify mitigation of surface and other conflicts e.g., seasonal access routes to protect wildlife, etc.



## RESPONSE TO COMMENTS

---

**Comment 5.7.** The Department of the Interior considers all vertebrate fossils to be important scientific resources. The Bridger and Green River Formations, which underlie most of the Moxa Arch project area, were identified in the DEIS as having high sensitivity for vertebrate fossils. Therefore, impacts to those resources must be addressed in order to meet the requirements of NEPA.

Portions of the project area are considered to have high potential for paleontological resources, as depicted in the revised DEIS Exhibit 3-2 (See Section 2 Errata). Development proposals in those areas will be reviewed for their potential to impact paleontological resources. However, a paleontological survey will not be required in all cases. Factors such as the presence of surficial materials (i.e., alluvium, sand dune, gravel), the amount of bedrock to be affected, and results of previous surveys will be considerations in determining the need for a survey. The need for mitigation (e.g., monitoring construction) would depend upon the results of the initial survey and the recommendations of the BLM Resource Area Geologist. BLM intends to retain flexibility in its approach to requiring paleontological surveys.

**Comment 5.8.** The text is modified to read "Frozen or saturated soils will not be used as construction material." See Section 2 Errata.

**Comment 5.9.** This mitigation item (2.2.4.2.8 under Vegetation and Wetlands) has been corrected as follows: "... 5) A site-specific survey for plant species of concern would be completed by the BLM botanist or other qualified botanist within known or identified potential habitat in the Moxa analysis area prior to initiation of any ground-surface disturbance. If species of concern ..." See Section 2 Errata.

BLM policy requires site-specific surveys for plant species of concern in known or identified potential habitat areas be completed prior surface disturbance. Threatened, endangered, and candidate plant species are protected under the ESA. Consequently, APD/ROW ground surveys will be conducted prior to construction activities by the BLM botanist or other qualified botanist. Avoidance or other mitigation measures (see Section 2.2.4.2.8, DEIS) are integrated into the APD/ROW permitting process.

**Comment 5.10.** Section 2.2.4.2.9 Wildlife, item 10 has been corrected as follows: "Field evaluations of sage grouse leks and nesting areas would be conducted by BLM or other qualified biologist prior to the start of activities in potential sage grouse habitat between February 1 and July 31. These field evaluations for leks and nesting would be conducted if project activities will occur in potential sage grouse habitat during the specified periods. BLM wildlife biologists would ensure that such surveys are conducted using proper survey methods at the proper time of year."

"Sage grouse leks would be protected by avoiding surface disturbance within 0.25 miles of a lek between February 1 and May 15. If this is not possible, intensive mitigation of the surface-disturbing activities would be provided, e.g., no placement of permanent and high profile structures (buildings, storage tanks, overhead powerlines, etc.) within 0.25 miles of a lek. Linear disturbances such as pipelines, seismic activity, etc., could be granted exceptions."

"If an occupied sage grouse nest will be adversely affected by surface disturbing activities, surface uses and activities would be delayed in the affected area until nesting is completed." See Section 2 Errata.

**Comment 5.11.** See response 5.6.

**Comment 5.12.** Because of the magnitude of potential impacts in certain areas to breeding and nesting sage grouse, as identified in the wildlife analyses found in the DEIS, the DEIS Section 4.9.6.2 has identified an opportunity to minimize impacts to breeding and nesting sage grouse. This could be accomplished through a habitat enhancement plan that will minimize or avoid impacts where feasible and replace sagebrush habitats, where removed, within a 2-mile radius of active leks. Identification of these and other measures, such as directional drilling from an existing pad, in a sage grouse habitat enhancement plan would help identify in advance opportunities to reduce unnecessary impacts to sage grouse.

**Comment 5.13.** Initial disturbance associated with each well site, access road, and pipeline is expected to average 15.31 acres. After construction and during production phase of each active well, partial reclamation would be completed on segments of the



## RESPONSE TO COMMENTS

---

well pad and access road no longer needed as well as the entire pipeline ROW. Assuming reclamation efforts are successful, approximately 9.45 acres associated with each well would be reclaimed. The remaining 5.86 acres of each well would remain disturbed for the life of the well. This acreage figure may be high, but for purposes of analysis was considered appropriate. See response 11.1.

**Comment 5.14.** BLM proceeded with the sage grouse surveys, even though it was late in the breeding season, to expedite data collection for the EIS process. These data are not absolute and additional data collection may be necessary (depending upon well location) during the APD/ROW process. BLM will assess the status of sage grouse during the site-specific analysis and conduct supplemental lek searches, in cooperation with the WGFD, as needed.

**Comment 5.15.** See response 5.14. Although there were short-comings in obtaining timely information on the location and activity status of species of concern within the Moxa Arch area, the data obtained represent the most current and accurate information available. Future monitoring of active nests or known habitat areas is the best action to take in demonstrating fulfillment of the mandate to prevent unnecessary or undue degradation of the land (FLPMA Section 302(b)).

**Comment 5.16.** As noted in Section 4.11.4 (Impacts Summary), any wells drilled in a VRM Class II area and more than two well pads per 640 acres in a VRM Class III zone would constitute a significant impact unless screened from view. Mitigation provided in Section 4.11.6 (Mitigation Summary) identifies an opportunity that would reduce impacts to visual resources in Class III areas by minimizing the overall number of contrasting points in the landscape and minimizing contrast in line and form. BLM will consider your suggested wording during its preparation of the Record of Decision. Also see response to comment 3.2.

**Comment 5.17.** Section 6 of the oil & gas lease terms states, "...Areas to be disturbed may require inventories or special studies to determine the extent of impacts to other resources. Lessee may be required to complete minor inventories or short term

special studies under guidelines provided by lessor". Also, the lessee/oil & gas operator have an obligation under Onshore Order No. 1 "...to see that their exploration, development, production and construction operations are conducted in a manner which (1) conforms with applicable Federal laws and regulations...(5) affords adequate safeguards for the environment..." Conducting cultural, paleontology, and biological surveys, when necessary, ensures that this obligation is met and that Federal and State laws and regulations are not violated.

BLM requires surveys for important resources (i.e., special status species, cultural resources, paleontology, etc.) in areas where the potential for that resource is known or is likely to occur. Additionally, BLM uses a tiered approach for NEPA compliance. The proponents have not provided BLM with site-specific locations of proposed project components. Therefore, BLM is required to conduct site-specific environmental analysis once the location of a project component is known and applied for. This may include the requirement to conduct cultural, paleontological, and/or biological surveys.

Yes, BLM is responsible to provide support in these areas. However, if timely processing cannot occur by BLM to meet the applicants schedules, then the applicant has the option to contract the survey or clearance work.

**Comment 5.18.** As stated in the DEIS, additional mitigation steps may be necessary to adequately offset potential adverse impacts of the Proposed Action or Alternatives on wildlife habitats and to ensure the execution of effective monitoring measures. BLM will meet with the WGFD and the operators to discuss and identify specific actions that will ensure accomplishment of these objectives. BLM can require additional mitigation on-lease. Off-lease mitigation opportunities are entirely voluntary.

**Comment 5.19.** The Moxa Arch Programmatic Agreement is in the early stages of scoping the terms of the agreement. The early months of 1996 have been spent consulting with SHPO, the Advisory Council on Historic Preservation, and other interested parties. BLM plans to have a final document signed by June 30, 1996.



## RESPONSE TO COMMENTS

---

### WYOMING WILDLIFE FEDERATION

**Comment 6.1.** The respondent is correct in noting the substantial increase in tourism (traveler) spending in southwestern Wyoming from 1993 to 1994. The increase in traveler spending in the region is related not only to increased tourism but also to increases in business, education, and commercial travel. Much of the traveler economy in the region is related to the level of traffic along Interstate 80. The proposed natural gas development is not expected to adversely impact the levels of business, education, or commercial travel in the region. If anything, the level of business and commercial travel may increase as a result of the Proposed Action or Alternatives.

The respondent is also correct in noting many of the important tourist destinations in the region: Flaming Gorge NRA, Fontenelle Reservoir, Seedskaadee NWR, and the Red Desert. The primary areas of interest to tourists in the Red Desert are the sand dunes, boar's tusk, wild horses, and petroglyphs. The proposed development is not expected to have an impact on the availability or quality of these recreation resources. Because the regional tourist economy is not expected to be adversely impacted by the proposed development, a detailed analysis of the region's tourism and traveler economy was not undertaken for the Moxa Arch analysis.

**Comment 6.2.** The statement in the DEIS (4.13) is incorrect. It should read "An increase in drilling and production facilities could also cause a safety hazard to those oil field workers who work in the traditional hunting areas during the hunting season." See Section 2 [Errata](#).

In accordance with FLPMA (Sec. 103 (1) and 202), management of the public lands within the Moxa Arch project area would occur so that the principal and major uses of grazing, fish and wildlife habitat development and utilization, mineral exploration and development, transportation, outdoor recreation, and rights-of-way are not excluded, but would continue to co-exist with the natural gas development. Nevertheless, as provided for in Section 302(b) of FLPMA, the Secretary may designate areas of public lands where, and establish periods when, no hunting should be permitted for reasons of public safety (in this case worker safety). However, this has not been

demonstrated to be necessary. BLM has no plans to close traditional hunting areas but does expect hunters, and other recreationists, to practice and take appropriate safety precautions.

**Comment 6.3.** Although most pronghorn exhibit seasonal movements, few have traditional fawning areas. Unlike many other ungulates that have traditional parturition ranges, pregnant pronghorn does give birth throughout most of their occupied range and show no specificity to certain natal areas. The term "natal sites" as referenced in the DEIS refers not to traditional parturition ranges, but rather, to a specific local where pregnant does drop their fawns. Disturbance at this time may result in the disruption of the reproductive process of some antelope at a local level, but impacts to most of the pregnant does throughout the region will be minimal and non-significant. Statements to this effect are based on the professional opinions of WGFD biologists who are responsible for managing the herd units and who are familiar with the area and its use by pronghorns.

**Comment 6.4.** There are certain restrictions placed on the BLM that prohibit requiring companies to fund or conduct off-site mitigation: Instruction Memorandum No. WY-96-21 refers to policy regarding off-lease compensation mitigation and states that the Regional Solicitor's Office determined that mandatory compensation is a form of "fund raising" and is beyond the BLM's legal authority. The Solicitor did state that if the money were used "on the lease" where the impacts occurred to enhance habitat for the species affected by the lessee's operation, then the fund would probably be appropriate; however, if the fund were used "off-lease" or for different species than those affected by the drilling then the fund may be inappropriate.

A voluntary compensation mitigation plan is being implemented in the Moxa Arch project area. An outcome of the "Supplemental Environmental Assessment to Amoco Production Company's Moxa Arch Natural Gas Production Project" (1992) has been the development and implementation of the "*Moxa Arch Pronghorn Habitat and Livestock Forage Loss Mitigation Plan*" by BLM, WGFD, participating Moxa Arch Operators, and landowners. The objective of this plan is to identify and implement specific opportunities, including off-site opportunities, to



## RESPONSE TO COMMENTS

---

reduce the impact of oil and gas development on pronghorn and livestock. The plan is being developed by the University of Wyoming Fish and Wildlife Service Cooperative Research Unit under contract with the BLM and the oversight committee (comprised of energy company contributors, private landowners, WGFD, and BLM). (See DEIS pages 3-33 and 4-48.)

**Comment 6.5.** A thorough analysis of potential impacts to recreation and wildlife resulting from implementation of the proposed action and alternatives was provided in the DEIS. The analysis determined that neither the Proposed Action nor alternatives to the Proposed Action would cause unnecessary or undue adverse impacts to recreation and wildlife resources with implementation of prescribed mitigation. Contrary to the respondent's statement, the area has not been "very popular" to anglers, hikers, or horseback riders. It has been and still is "popular" to hunters and wildlife. Anglers do use Fontenelle Reservoir and the Green River, but those areas will not be affected by the project development.

Even with implementation of the Moxa Arch development, as stated above, the principal and major uses of grazing, fish and wildlife habitat development and utilization, mineral exploration and development, transportation, outdoor recreation, and rights-of-way, albeit that each would be adversely affected to varying degrees, would not be eliminated, but would continue to co-exist with the natural gas development (FLPMA Sec. 103 (1) and 202)).

### OREGON/CALIFORNIA TRAILS ASSOCIATION

**Comment 7.1.** The various historic trails in the study area will be managed in conformance with our current policy, developed pursuant to the *Comprehensive Management and Use Plan, Oregon National Historic Trail*, by the USDI, NPS (1981), and the *Oregon/Mormon Pioneer National Historic Trails Management Plan*, by USDI and BLM (1986), which states:

"Lands within the (½ mile-wide) corridor segments should possess a reasonable degree of environmental integrity. The trails

themselves should be in relatively unmodified condition. For the most part they should appear as they may have in the mid-1880s (1986:12)."

BLM's trail management policy is best expressed in the Kemmerer RMP ROD (1986):

"The objective will be to protect the trails from visual intrusion and surface disturbance and to maintain the integrity of the setting. Management of historic trails will emphasize preservation coupled with increased visitor use and appreciation of the trail system. To provide a protective corridor for the trail, generally visual intrusion and surface disturbance will be restricted or prohibited within 1,320 feet from either side of an historic trail (may depend upon topography and existing surface disturbance), or within the visual horizon of the trail, whichever is closer."

"Three elements relating to trail significance are: intact physical remains (e.g., trail ruts, campsites), integrity of natural setting, and good historical association (presence of archival verification of location of trails or other historic sites such as stage stations, graves, etc.) These and other guidelines will be considered for decisions that may affect historic resources (1986: 35)."

The trails in the Moxa Arch study area are managed in accordance with these guidelines, so that segments within proposed impact areas are evaluated with consideration of their physical conditions, settings, and historical associations. The portions of trails that rank highest in their evaluations are provided the most protection within the corridor, while segments evaluated with low rankings are not afforded the same degree of protection due to their compromised historical integrity.

### SIERRA CLUB LEGAL DEFENSE FUND

**Comment 8.1.** Contrary to the responder's assertion, no oil and gas "leasing" actions are pending in the project area or cumulative impact study area. The responder has confused oil and gas leasing with the



## RESPONSE TO COMMENTS

---

proposed infill drilling which continues development of existing Federal oil and gas leases. This continued development requires many agency actions--such as the site-specific analysis, review, and approval or denial of APDs and rights-of-way for roads and pipeline.

The Kemmerer Resource Area Oil and Gas Leasing Environmental Assessment Record (1979) and the Kemmerer Resource Management Plan (RMP) (1986) identified lands in the Moxa Arch area as available for lease subject to various resource protection requirements. The resource protection measures contained in the RMP are designed to ensure that the environmental consequences of oil and gas activities are reduced as much as reasonably possible. It was during the land use planning process that leasing or not leasing parcels within the subject area was considered. This decision process included full public involvement through public meetings and written comments. BLM's planning effort is in compliance with NEPA and the CEQ regulations implementing NEPA. BLM's planning documents serve as the programmatic leasing environmental documentation in compliance with NEPA.

**Comment 8.2.** BLM, in accordance with regulations of the Council of Environmental Quality (CEQ, 40 CFR 1508.7), has considered the cumulative impact of the Moxa Arch natural gas project and other existing and reasonably foreseeable projects within the area/region affected by the Moxa Arch project. BLM's publication "*Guidelines for Assessing and Documenting Cumulative Impacts*" (April 1994) was used as a guide in selecting the cumulative impact analysis area for the project. Based upon the specific boundaries of the proposed action, cumulative impacts were analyzed in terms of the specific resource or ecosystem being impacted. Thus, the cumulative impact area identified for each resource included watersheds, viewsheds, biological units (such as the habitat of the affected big game herd unit(s)), communities potentially affected, as well as existing and reasonably foreseeable activity in these affected areas. An example of the specific areas analyzed is addressed in response to Comment 8.3.

With the exception of the cumulative impact analysis area for air quality, the cumulative impact areas were determined at the scoping phase of the project and the

analysis was consistent with that required under NEPA and BLM's "*Guidelines for Assessing and Documenting Cumulative Impacts*". Potential cumulative impacts to the Class One airsheds of the Bridger-Teton National Forest were not identified during scoping. However, upon review of the Moxa Arch and Fontenelle Draft EISs, the Forest Service, Wyoming Department of Environmental Quality-Air Quality Division, and the Environmental Protection Agency identified cumulative environmental impact concerns to air quality that had not been addressed. In response, the BLM, through the expertise of the firm *TRC Environmental Consulting, Inc.*, has supplemented the air quality sections of the DEIS with an air quality cumulative impact analysis addressing the construction and operation phases of oil and gas development.

BLM has complied with the rules announced in Kleppe v. Sierra Club, and Sierra Club v. Penfold. As noted in Kleppe, the definition of the region to be analyzed and the scope of the impact statement is left to the discretion of the agency. Also, the BLM is presently conducting the *Southwest Wyoming Resource Evaluation*, the purpose of which is a formal review of BLM land use planning decisions to determine whether present decision-making adequately considers cumulative impacts of development in the region.

BLM believes that the proposed oil and gas development activities and the on-the-ground situation in the Moxa Arch area and Southwest Wyoming are substantially different from the Penfold example cited by responder.

The proposed activities analyzed in the Expanded Moxa Arch Area Natural Gas Development Project Draft EIS are not connected--either infrastructurally, geologically or spatially--with proposed oil and gas activities in the Fontenelle area or in other parts of southwest Wyoming. Infill drilling projects in the Moxa Arch, Fontenelle, and other areas have independent utility; in other words, they are not dependent on the other for their completion, operation or success. Approval of the Moxa Arch infill drilling projects would in no way result in a commitment to proceed with any other oil and gas project in southwest Wyoming; nor would it prejudice review,



## RESPONSE TO COMMENTS

---

analysis or BLM decisions regarding other projects in the region.

The Moxa Arch and the nine projects referred to, including the Fontenelle projects, would have synergistic impacts to the extent analyzed in the DEIS. The projects would not occur in the same place and the observed adjacency of the Moxa Arch and Fontenelle boundaries is simply a result of the expanded cumulative impact study areas used in each analysis in response to concerns expressed during scoping. No contiguous development has been proposed. The Fontenelle and Moxa infill drilling projects are entirely separate and independent in their utility, intent, construction, operation and maintenance.

To further address public concerns about "piecemeal analysis," the Proposed Action considered the "maximum" or "worst case" level of development that could occur in the Moxa Arch area over the next 10 years. In this way BLM would avoid a situation of staged developments for which several NEPA documents would have to be prepared. The likelihood that the projected levels of development will be reached is truly remote; therefore the Proposed Action far exceeds the level of reasonably foreseeable development. Nevertheless BLM consider the "maximum" or "worst case" development scenario to inform the public and the BLM decision-maker of the maximum impact that could occur associated with this level of development.

The resources adversely affected by the Proposed Action are largely separate from those affected by other projects in southwest Wyoming. For example, much of the Proposed Action would be constructed downstream of Fontenelle Reservoir which traps sediment added to the Green River. The Proposed Action would occur within different big game herd units, tap different oil and gas reservoirs and affect different visual resources and transportation corridors than the Enron Burly, Stagecoach Draw, Fontenelle and Bravo Fields. The fact that the boundaries of the cumulative impact study areas touch does not indicate any relationship between the two sets of projects. Also, see response 8.1.

**Comment 8.3.** The DEIS extensively discusses the cumulative impacts of past, present and reasonably

foreseeable actions affected by the 744 square mile expanded Moxa Arch project area. The extensive analysis and the cumulative impact assessment area varied by resource, e.g., 3,158 square miles for soils and watershed impacts; 1,145 square miles for antelope herd unit impacts; 1,907 square mile for livestock grazing and allotment impacts; etc. These areas were deemed sufficient to encompass possible connected actions and common resources.

While the respondent is free to take issue with the spatial extent of the cumulative impact analysis, Federal regulations and the courts give the BLM the latitude to determine the appropriate spatial scale of analysis. The courts have generally deferred to such determinations unless the agency has arbitrarily defined the spatial scale of analysis to diminish the potential significance of the impacts of the project. The cumulative impact study area considered in this EIS extends far beyond that which has been found to be affected by the project.

BLM concurs that the DEIS did not adequately address the cumulative effects of "maximum" or "worst case" expanded Moxa Arch development on one resource, air quality. During scoping, other than concern for dust abatement, regional air quality concerns were not identified. Not until the DEIS was circulated were comments received raising concern for cumulative impact to regional air quality. In response to comments received, the BLM, through the expertise of the firm *TRC Environmental Consulting, Inc.*, has supplemented the air quality sections of the DEIS with an air quality cumulative impact analysis addressing the construction and operation phases of oil and gas development from the reasonably foreseeable implementation of the Moxa Arch, Fontenelle, Stagecoach Draw, Jonah, Wamsutter II, and other projects within southwest Wyoming. See Section 2 Addendum and Appendix A of this final EIS. The details of this analysis are available in a separate Technical Report entitled, "*Cumulative Impact Analysis of Southwestern Wyoming Natural Gas Development Projects on Air Quality*". A copy of the technical report can be obtained from the Bureau of Land Management, 280 Highway 191 North, Rock Springs, WY 82901.

**Comment 8.4.** The cumulative *direct* impact from surface disturbance (past, present, and future) is less



## RESPONSE TO COMMENTS

---

than 10 percent. The data is summarized in the combination of DEIS Tables 2-5 Comparative Impact Summary, 2-6 Existing Disturbance Within the Moxa Analysis Area, and 4-8 Summary of Total Disturbance and Percent of Hydrologic Unit for the Moxa Analysis Area, the Area Outside Moxa, and For the Cumulative CIA Area. The combined data shows that, within the CIA area (2,021,167 acres), 1) prior to reclamation of areas not needed for production operations 70,472 acres would be disturbed or 3.5 percent of the CIA area; and 2) post reclamation of areas not needed for production operations 41,905 acres or 2.1 percent of the CIA area would remain disturbed. Within the Moxa Arch project area (476,261 acres), 1) prior to reclamation of areas not needed for production operations 46,292 acres would be disturbed or 9.7 percent of the project area; and 2) post reclamation of areas not needed for production operations 17,725 acres or 3.7 percent of the CIA area would remain disturbed.

**Comment 8.5.** The National Environmental Policy Act (1505.2) provides for the adoption of a monitoring and enforcement program as part of the Record of Decision. BLM will specify this requirement at that time. Regardless, BLM assures the Sierra Club that the measures listed in the Moxa Arch DEIS are not "mere vague statements of good intentions". The Federal Land Policy Act, National Environmental Policy Act, Mineral Leasing Act, and numerous other laws and regulations provide for the enforcement of, and penalties for non-compliance with, required mitigation. BLM will maintain close contact with the operators and conduct frequent evaluations of development and operations activities to ensure that all relevant mitigation measures prescribed in the EIS and carried forward into the Record of Decision are applied on federal lands. An exception to a mitigative measure may be approved on public land on a case-by-case basis when deemed appropriate by the BLM. Any exceptions would be subject to appropriate level of environmental analysis and coordination with appropriate federal, state, and/or local agencies.

**Comment 8.6.** To the contrary, the DEIS provides appropriate detailed analysis of the potential for environmental impact to protected plant species and further opportunity to mitigate potential impacts. The conclusions on impacts are environmentally

conservative based on an objective evaluation of potential impacts to such species given the programmatic scope of the DEIS. As discussed in detail in response 8.7, all potential suitable habitat for special status plants was identified in the field based on site-specific study of known habitat and as mapped from aerial photographs with field verification. This map is presented as DEIS Exhibit 3-13 and Map 2 of the *Vegetation, Wetlands, and Special Status Plant Species Technical Report for the Moxa Arch EIS Project* (ECOTONE 1995). A site-specific impact assessment using these maps could not be accomplished for the DEIS because of the programmatic nature of the EIS and the fact that the operators have not identified specific locations of project facilities. The opportunity to avoid special status plant habitat, and therefore populations, was identified in the DEIS. However, the operators have not had the opportunity to determine the actual feasibility of avoiding the habitat given this pre-planning stage in the authorization process.

Thus, taking an environmentally conservative approach, it was assumed that not all habitat could be avoided. At this stage of the authorization process, it would be subjective to assume in the EIS that all habitat could be avoided. Therefore, in DEIS Section 4.10.5, page 4-79, mitigation would include clearance surveys for special status plant species at proposed project facilities and along linear facilities. If such species were found, the BLM would require the operators to avoid such plants, including individuals, populations, and/or habitat to the maximum extent practicable. The FEIS at 4-77 should be reworded to say, "... given the propensity of the analysis area to contain special status plants and the lack of site-specific comprehensive surveys at project facility locations in the field to identify species and habitat". See Section 2 Errata.

**Comment 8.7.** Reconnaissance-level field investigations for special status plant species were conducted for this EIS. The scope and the results of the investigations are detailed in the *Vegetation, Wetlands, and Special Status Plant Species Technical Report for the Moxa Arch EIS Project* (ECOTONE 1995). The analysis-level of the DEIS is programmatic. As such, neither the operators nor the BLM can identify specific locations of drill/well sites, pipelines, access roads, etc. Given this lack of site-



## RESPONSE TO COMMENTS

---

specificity of the programmatic EIS, a total clearance survey for special status plants was deemed unreasonable. Rather, all potential habitat for such species was located in the field and mapped with limited field search for the species potentially occupying such habitat. Without clearance surveys for such species along specific alignments or project sites, site-specific information cannot be developed for the Moxa Arch programmatic DEIS. Therefore, site-specific impacts cannot be assessed. The referenced statement takes this into consideration by adopting an environmentally conservative assumption.

As discussed in the Vegetation Report (ECOTONE 1995) and in Section 4.10.5, page 4-79 of the DEIS, mitigation would include clearance surveys for special status plant species at proposed project features and along linear facilities. If such species were found, the BLM would require the operators to avoid such plants including individuals, populations, and/or habitat. Special status plants, including the federally threatened Ute's ladies tresses, are not protected on non-federal administered lands under the ESA. However, BLM policy is to conduct appropriate surveys where known or identified potential habitat exists for any undertaking requiring federal approval. The BLM has the authority to protect such species on federal lands directly under their management authority, but not on other lands. Therefore, there could be differential treatment of such species between BLM-administered lands and non BLM-administered lands resulting in potential cumulative impacts. This point is made in the DEIS. Again the DEIS took an environmentally conservative approach by mentioning this potentiality.

The potential location of special status plants was determined based on mapped suitable habitats as presented in the Vegetation Report (ECOTONE 1995). Mitigation would require all proposed facilities, on federal land, in potential habitat to be cleared for such species prior to construction. Except for Ute's ladies tresses, none of the other special status plant species are listed or proposed for listing. Per USFWS policy dated August 21, 1995, only Category 1 species are considered candidate species. All candidate species in the project area are Category 2 or 3 and are no longer given the previous consideration under the ESA (BLM policy stills protects C2 plant species). Therefore, the potential

for violation of the ESA is very low in regard to plants. The potential for occurrence of Ute's ladies tresses in the Moxa area is low and the potential for impact is also low. Site-specific clearance surveys will be required in certain areas to determine if specific project components need to be relocated to avoid such plants and/or habitat.

**Comment 8.8.** A great deal of time, fact finding, thought, and professional analysis were expended in arriving at the conclusions drawn in the DEIS. During 1994, 1,290 hours were spent collecting wildlife data on the ground. This includes a total of 130 hours for aerial and ground surveys of sage grouse and raptors, 610 hours for prairie dog aerial and ground surveys and additional raptor work, and 525 hours for the remaining ground mapping of prairie dogs. Although no "formal" surveys were conducted for candidate wildlife species, a substantial number of incidental observations of these species were documented during field work. In addition, all existing pertinent data available were obtained from the WGFD, the BLM, the Nature Conservancy, and the FWS and was used as appropriate in the analysis of potential impacts.

Prior to any construction activity, additional ground surveys may be required depending upon the potential for a certain species of concern to occur. Also see responses 5.14 and 5.15.

**Comment 8.9.** The DEIS appropriately and adequately addresses displacement and cumulative impacts on wildlife. Numerous mitigative measures were identified to address all wildlife species present or potentially present in the area. These measures are listed and described in the DEIS in Sections 2.2.4.2.9, 4.9.6, and Appendix A to prevent unnecessary or undue adverse impact to all wildlife species.

**Comment 8.10.** The potential for regional impacts was considered for all species of wildlife. A substantial number of hours were spent in assessing potential impacts to big game species at the herd unit (regional) level. For example, pronghorn antelope analyses involved the West Green River, Carter Lease, and Uinta-Cedar Mountain Herd Units; Mule Deer the Wyoming Range and Uinta Herd Units; Elk the West Green River and Uinta Herd Units; and Moose the



## RESPONSE TO COMMENTS

---

Lincoln and Uinta Herd Units. See Sections 3.9.3 and 4.9.3.1.2.

The BLM believes that the wildlife impact analysis contained in the EIS is quite substantial, adequate, and, given implementation of the avoidance and mitigation measures described in Sections 2.2.4.2.6, 2.2.4.2.7, 4.10.4, 4.10.5, 5.2.4, and Appendices A and B of the DEIS, unnecessary and undue adverse impacts can be avoided.

**Comment 8.11.** Sections 4.5.5 and 4.6.5 provide appropriate and adequate detail on the cumulative effects of natural gas development in the Moxa Arch area and in the greater cumulative impact analysis area (CIAA). The CIAA was determined following BLM guidelines. Also, the *Soils and Water Resources Technical Report* (ECOTONE 1995) provides more detailed information upon which analysis on cumulative impacts of natural gas development within the CIAA were based.

**Comment 8.12.** The Final EISs for Fontenelle and Moxa Arch are modified to incorporate the appropriate level of cumulative air quality impact analysis, and includes well development for Moxa Arch, Fontenelle, Stagecoach Draw, Jonah Prospect, Greater Wamsutter, Mulligan Draw, Creston-Blue Gap, Dripping Rock, Hay Reservoir, and BTA Bravo proposed developments. See the Section 2 Addendum and Appendix A. Also, see response to comments 4.2 and 4.3.

Identification of the nearest "nonattainment" area in the DEIS is incorrect. The trona industrial area is not in a nonattainment area. The concentration contours do not overlap. The impact of one well, defined by concentration contours, already takes into account the topography and the meteorology of the area. See Section 2 Errata.

**Comment 8.13.** BLM agrees that other important resources are within the immediate region. However, BLM does not agree with the notion that these important resources will be forever lost if mineral development occurs. On the contrary, all of these resources (i.e., Seedskaadee Wildlife Refuge, designated recreation areas, historic trails and grave sites, and pre-historic rock art sites) are fully protected from development per mitigation measures

outlined in Sections 2.2.4.2, 4.9.6, 4.10.5, 4.13.5, 4.15.6, 5.0, and Appendices A, B, and C.

**Comment 8.14.** BLM acknowledges that the Moxa Arch core area is highly developed for natural gas and that the landscape has been altered. This was recognized in the Kemmerer Oil and Gas Leasing Environmental Assessment Record (1979) and the Kemmerer RMP Draft and Final EISs (1986) and is an accepted consequence of oil and gas development. But even this level of development has not eliminated or precluded the principle and major uses within the area from occurring. Further, as noted in Peshlakai v. Duncan, 476 F. Supp. 1247, 1260 (D.D.C. 1979), as long as the underlying analysis of the cumulative impacts of a particular project was adequate under NEPA, there is no legal requirement that a project be held up while an agency studies regional cumulative impacts.

### U.S. DEPARTMENT OF INTERIOR - FISH AND WILDLIFE SERVICE

**Comment 9.1.** See responses 8.1, 8.2, 8.6, 8.7, 8.8, and 8.9.

**Comment 9.2.** The 400 wells not covered by listed environmental documents are covered in the Kemmerer Oil and Gas Leasing EA (1979) and the Kemmerer RMP. These wells are located south of I-80. The listed Moxa Arch EAs pertain to only the portion of Moxa Arch located north of I-80.

**Comment 9.3.** BLM concurs that directional drilling may be used to benefit other wildlife resources such as raptor nesting sites. This clarification has been made in the FEIS. See Section 2 Errata.

**Comment 9.4.** All open produced water pits will be netted or otherwise covered to comply with the Migratory Bird Treaty Act.

**Comment 9.5.** Thank you for your comment. Biologists will be involved in transportation planning.

**Comment 9.6.** In order to minimize the potential impacts to raptor nests as a result of expanded field development and to avoid the possibility of the BLM and its operators from being at risk for "taking" under the Migratory Bird Treaty Act, additional mitigative



## RESPONSE TO COMMENTS

---

measures could be considered that include but are not limited to one or more of the following: (1) avoid placement of permanent facilities within designated buffer zones of viable raptor nests, (2) construction of artificial nesting structures away from project activities, and/or (3) pre- and post-construction monitoring to determine which nests are active prior to construction and which nests are used once the operations phase begins.

Where potential nesting habitat exists, BLM requires surveys for nesting raptors to ensure that nests are identified and protected. Project activities would not affect key nesting habitats such as the Green River in Seedskaadee NWR. Considering the Kemmerer Resource Management Plan as well as the results of past surveys, BLM has identified raptor concentration areas within the project area which could require preparation of a raptor management plan similar to those developed for raptor concentration areas identified in the BLM Platte River or Great Divide Resource Areas. BLM has made an addition to the Moxa Arch DEIS, page 4-66, as shown in Section 2 Errata. This change is consistent with that which is provided for in the Fontenelle FEIS and the Stagecoach Draw EIS Record of Decision, to ensure appropriate protection of raptors in the long-term.

**Comment 9.7.** Thank you for providing BLM with the USFWS' recommended guidelines for mitigating effects of the proposed project on prairie dog colonies. These measures have been incorporated into the FEIS as potential mitigation opportunities (Section 2, Errata). BLM will work with the operators to retain the Moxa Arch complex integrity as a potential black-footed ferret reintroduction site. BLM will consider the implementation of the requested actions based on site-specific circumstances and consultation with the USFWS as required by Section 7 of the ESA and incorporate the necessary measures into the APD/ROW permitting process.

**Comment 9.8.** Reference to WGFD herd or population objectives does have indirect biological meaning. BLM and WGFD have agreed upon certain big game population objective levels which are based upon habitat availability and usability. These objective levels are established in BLM land use plans. Therefore, any action authorized by BLM on public lands must consider the potential for affecting

attainment of the established objectives or threshold. Comparison between the Proposed Action and Alternatives is appropriate to determine if one would cause more or less impact than the other.

The likelihood of adverse impact or contribution to need for listing candidate plant or animal species is appropriately presumptuous. This conclusion is based upon facts collected during ground surveys conducted within the Moxa Arch project area. See response to comments 8.1, 8.2, 8.6, 8.7, and 8.9.

Table 2-5 in the DEIS is corrected to reflect that the project will result in a "may effect" situation for listed fish. See Section 2 Errata.

**Comment 9.9.** Although there were short-comings in obtaining timely information on the location and activity status of raptor nests within the Moxa Arch area, the data obtained represent the most current and accurate information available for the area. Future monitoring of raptor nests is probably the best action to take in fulfilling future information needs in the area. Therefore, the BLM will initiate efforts to address raptor mitigation plans within the Moxa Arch area with the USFWS. See response to comments 8.8 and 9.6.

**Comment 9.10.** Thank you for your comment.

**Comment 9.11.** The 10 percent threshold for vegetative removal is based upon a maximum disturbance factor within a "hydrologic unit" (see DEIS section 4.5.2.2, Soils Significance Criteria, Exhibit 4-3, Table 4-8, and narrative on pages 4-25, 4-28, and 4-29). Disturbances in excess of 10 percent would be expected to cause significant losses of soil material due to wind and water erosion affecting reclamation, sediment increase due to stormwater discharge, etc.

**Comment 9.12.** The goal of Section 404 is to avoid and/or minimize adverse impacts to waters of the U.S., including special aquatic sites and jurisdictional wetlands. Activities that involve discharge of pollutants into waters of the U.S. are regulated by the EPA and the COE pursuant to the CWA. Specifically, activities that involve discharge of dredge and/or fill (i.e., earth material) are regulated by the COE pursuant to Section 404 of the CWA.



## RESPONSE TO COMMENTS

---

Recently (September 17, 1993), the COE's regulatory authority has been extended to include activities that involve excavation and dredging of waters of the U.S., including special aquatic sites and jurisdictional wetlands. A Section 404 permit is required for legal discharge of dredge and/or fill into wetlands or excavation/dredging of such areas. Such a permit is issued by the COE. Regional/General permits, including Nationwide Permits, are issued with several conditions and requirements including that the proposed action would not cause significant impact to waters of the U.S. Further, general and special conditions applied to such permits further require the avoidance and/or minimization of adverse impacts to such waters. Individual Permits require strict compliance with the Section 404(b)(1) guidelines that explicitly state the requirement of impact avoidance and minimization. Where residual impacts would result, even with avoidance and impact minimization, compensatory mitigation is usually required. If planned and implemented properly, compensatory mitigation offsets adverse impacts. Therefore, the Section 404 program explicitly, and by default, removes the potential for significant impact to wetlands on all lands within the Moxa Arch area.

**Comment 9.13.** The adverse impact figure of 223 acres is based solely on the proportion of the analysis area covered by wetlands applied to the total area of disturbance, both of which are environmentally conservative figures given the programmatic nature of the EIS. It should also be noted that the area of 223 acres is likely an environmentally conservative figure due to the small scale of mapping (1:24,000) and the wider-than-reality width of wetlands shown to facilitate mapping at the small scale. Further, the 223-acre figure is not based on a site-specific impact analysis due to the programmatic nature of the EIS.

Given these facts and the requirement of impact avoidance and impact minimization pursuant to Section 404, the ultimate adverse impact would be substantially less than 223 acres. The recommended proactive approach to mitigation planning on a project basis rather than feature basis is very relevant. The BLM, in consultation with the COE, USFWS, WGFD, and EPA, should consider this approach as a requirement of the project. Otherwise, assuming project features are permitted by the COE (as opposed to the total project), appropriate mitigation for each

facility would be more likely. Mitigation in place prior to the impact is an appropriate mitigation strategy to ensure such mitigation is fully effective in replacing all functional values lost with the impacts.

**Comment 9.14.** Inventory/monitoring efforts are identified in the DEIS, Sections 4.9.6, 4.10.5, and 5.0.

**Comment 9.15.** See Responses to comment 9.8 regarding herd objectives and comment 9.6 regarding raptor nest protection. Sage grouse protective measures have been modified on page 2-37 in the DEIS to ensure long-term protection (see Section 2 Errata). BLM agrees that without adequate mitigative measures there would be significant impacts to various species such as antelope and sage grouse. However, the unnecessary and undue effects of impacts would be offset if mitigation and reclamation measures recommended in the DEIS are implemented (DEIS 2.2.4.2.9, 2.2.4.2.10, 4.9.6.1, 4.9.6.2, 4.9.6.3, 4.9.6.4, and 4.9.6.5).

**Comment 9.16.** Section 4.9.6.5 in the DEIS has recognized the need for additional data/information needs through inventory and monitoring. Also see response to comments 5.17 and 9.14.

**Comment 9.17.** See responses to comments 8.14, 9.6, and 9.14. BLM will initiate efforts to address raptor mitigation plans within the Moxa Arch area with the USFWS. See DEIS Section 5.2.6 for monitoring provisions.

**Comment 9.18.** See responses 9.6, 9.9, 9.15, and 9.17. BLM has the authority to require that permanent and high profile structures such as well pads, roads, buildings, storage tanks, overhead powerlines, etc., not be allowed within 825 feet (0.25 km) of active raptor nests. The buffer distance may vary depending upon the species involved, prey availability, natural topographic barriers, and line-of-sight distances. Linear disturbances such as pipelines, seismic activity, etc., could be granted exceptions.

**Comment 9.19.** Comment noted. See response to comments 9.8.

**Comment 9.20.** Reconnaissance-field surveys for individuals, populations, and suitable habitat of the



## RESPONSE TO COMMENTS

---

Ute's ladies tresses was accomplished in August 1994 by qualified rare plant botanists (see the *Vegetation, Wetlands, and Special Status Plant Species Technical Report for the Moxa Arch EIS Project* (ECOTONE 1995)). However, site-specific clearance surveys could not be conducted given the programmatic scope of the EIS. Therefore, all sections of perennial stream channels and other areas potentially providing habitat could not be investigated in detail. However, based on the expertise and experience of the investigators with this species, only small areas of low to moderate value habitat (but not plants) were identified on limited sections of the Hams Fork and Blacks Fork Rivers. The species is not historically known to occur in these areas. Therefore, the likelihood of adverse impact is low. Section 4.10.5 discusses mitigation measures for this plant that include site-specific clearance surveys of all facilities in potential habitat areas and if found, the facilities would be relocated to avoid adverse impact. BLM policy, in addition to the ESA, requires protection and conservation of this species. Therefore, the "not likely to adversely affect" determination is accurate as presented in the DEIS, and meeting the conditions specified should therefore receive the Service's concurrence.

**Comment 9.21.** See response to comment 9.7. Thank you for the Services's concurrence in the analysis finding that the Moxa Arch project, given the specified mitigation measures, is "not likely to adversely affect" the black-footed ferret, bald eagle, peregrine falcon, or whooping crane.

**Comment 9.22.** Yes, see response to comment 9.6.

**Comment 9.23.** Thank you for providing the BLM with the USFWS recommended survey guidelines for mountain plover. Field surveys will be completed at the APD level prior to the construction of individual wells by BLM specialists or qualified consultants working for the operators. The guidelines have been incorporated into the FEIS by their addition to the DEIS Section 4.10.4, page 4-78. See Section 2 Errata.

### MARATHON OIL COMPANY

**Comment 10.1.** See response 5.7.

**Comment 10.2.** The basic premise and requirement of the law "NEPA" is that the environmental effects of an action be considered before any activity requiring a federal permit be undertaken. Under Title I of the Act, the definition of the national environmental policy is expanded as follows: "*The congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth, high density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances...*" Under NEPA, the issue is the impact of man's activity on the natural environment, not natural processes. Predator/prey responses and weather conditions are just two of the many natural processes that create the high desert ecosystem. BLM is required to consider the possibility for and extent of additional and interactive pressure on wildlife from natural gas exploration and development activity.

**Comment 10.3.** Thank you for the information.

**Comment 10.4.** Socioeconomic Sections 3.14 and 4.14 sufficiently address past, present and reasonably foreseeable socioeconomic data pertaining to the potential beneficial and adverse effects from implementation of the Moxa Arch project. Projections over a 10 year period have been made, which is the projected time frame within which implementation of the Proposed Action or Alternative A would occur. Data presented is sufficient for elected officials to make interpretations.

**Comment 10.5.** Although there are positive attributes of using a sterile standing crop in replacement of mulch, there is still a lag-time from when the annual seeds are planted to when the plants mature and provide a mulch cover. Broadcast application of a hay mulch provides immediate results in terms of soil protection from raindrop impact and overland flow. This is particularly important in the project area where random intensity and short duration precipitation events and subsequent runoff occur. Consideration for the use of mulch, as prescribed in the reclamation guidelines, is consistent with the BLM Wyoming State Office reclamation policy (BLM 1990) and Rock Springs District reclamation policy. The erosion evaluation presented in Section 4.5.3 and in the *Soils and Water Resources*



## RESPONSE TO COMMENTS

---

*Technical Report* (ECOTONE 1995) illustrates the importance of mulch in reducing surface runoff, erosion, and sedimentation from project disturbances. Roughening the soil surface across topographic gradients is an applicable measure, but still leaves the soil surface susceptible to erosion from raindrop impact. The possibility of using a standing crop of sterile annual plants will be included in the FEIS. See Section 2 Errata.

**Comment 10.6.** Reclamation guidelines presented in Appendix B and as referenced throughout the DEIS pursuant to Executive Order 11987, and in the interest of maintaining healthy native plant community, require emphasis be placed on native species in the reclamation effort. Initial seed mixes developed for this project emphasized both natives and desirable exotic species; however, the BLM did not feel inclusion of such exotics was consistent with this executive order. Reclamation monitoring along the Kern River Lateral Pipeline as reported in the *Vegetation, Wetlands, and Special Status Plant Species Technical Report for the Moxa Arch EIS Project* (ECOTONE 1995) and the *Soils and Water Resources Technical Report* (ECOTONE 1995) showed that the prevalence and frequency of desirable shrubs was higher than along similar reclamation efforts in the project area where seed of such shrubs was not included in the seed mixes. The data showed no indication that the cover or frequency of desirable forbs and grasses either out-competed the sagebrush or vice versa. Hastening reclamation to "predisturbance" conditions by including native shrubs is consistent with BLM reclamation policy and goes a long way toward enhancing visual aesthetics of disturbances, also a goal of reclamation.

The seed mix that will be applied in the restoration of disturbed areas within the Moxa Arch project area is changed from that listed in Appendix B. The revised mix is the result of an extensive assessment of successful reseeding efforts within the Moxa Arch area. The assessment is the result of the combined coordination efforts of BLM botanist, University of Wyoming FWS Cooperative Research Unit, industry, and landowners. See Section 2 Errata.

**Comment 10.7.** BLM generally does not require that an operator replace more topsoil than was originally present on location. However, the depth of reapplied

"topsoil" (defined as any natural plant growth medium developed on-site that exhibits physical, biological, chemical, and nutrient characteristics conducive to re-establishment of a desirable vegetal cover), when possible, should be optimized because salvage, storage, and respreading of topsoil results in mixing and reduction of quality as a plant growth medium. Guidelines on topsoil salvage, handling, storage, and re-spreading presented in Appendix B of the DEIS are consistent with reclamation policies of the Rock Springs BLM office. In situations where four to six inches of topsoil cannot be respread, topsoil salvage, handling, storage, and re-spreading will be accomplished as specified by the BLM Authorized Officer (page B-5, Section 4.1, lines 5 and 6). For example, if in the natural state only one inch of usable "topsoil" is present, by the time the one inch is salvaged, handled, stored, and respread, the qualities of the "topsoil" may not promote reclamation goals and may be essentially ineffective. Therefore, there are sound scientific and technical reasons to require more topsoil to be respread, if available, on areas that have less than four to six inches of salvageable topsoil.

**Comment 10.8.** See response 10.5. The referenced guideline refers to the time of application. Although the portion of mulch laying unbound to the soil surface that is susceptible to wind removal provides soil surface protection, the portion of mulch that is crimped into the soil with ends emerging from the soil surface provides most of the protection. The crimped mulch is not very susceptible to wind erosion, unless the soil mass holding the anchored mulch is also eroded which would represent a very severe impact--loss of the soil resource. Therefore, the recommended guidelines on mulching as presented in the DEIS are reasonable and appropriate.

**Comment 10.9.** Investigations on reclamation success conducted by the technical specialists involved with the DEIS, strongly suggest that the major source of reclamation failure (although low) in the Moxa Arch area is poor plan implementation and poor performance monitoring, assuming an adequate reclamation plan is developed. The need for effective performance monitoring cannot be over emphasized. Scaled back frequency or intensity of monitoring unacceptably increases the potential for reclamation failure because areas of inadequate reclamation may



## RESPONSE TO COMMENTS

---

go unnoticed and un-remediated until it is too late. Monitoring will be conducted in accordance with 40 CFR 1505.2(c).

### PETROLEUM ASSOCIATION OF WYOMING

**Comment 11.1.** As described on page 2-6, Section 2.2.2.1, second column, first full paragraph, the traditional drill pad in the Moxa Arch area is approximately 3.4 to 3.6 acres in size. This assumption was explicitly used to develop impact areas in Section 4.5.3.1 and then tracked throughout the DEIS. Construction of a drill pad requires variable additional disturbance for cut-and-fill slopes, topsoil and soil stock piles, and ancillary disturbances, bringing the total area of disturbance to a figure greater than the 3.4 to 3.6-acres of drill pad surface. Because of the variability in the area of cut-and-fill, topsoil stockpile, etc. disturbance depending on the specific site conditions, an assumed 5.0 acres of total disturbance per drill site was used in the DEIS. This area is consistent with measured disturbances associated with wells being drilled during the field investigations conducted for the DEIS in the summer and fall of 1994. Area of disturbance associated with other project feature construction were similarly described in Sections 2.2.2.2, 2.2.2.3, 2.2.3, and 4.5.3.1.

Based upon these assumptions, the total area of short-term construction disturbance was estimated to be approximately 20,293 acres. This estimate does not take into consideration site-specific conditions because of the programmatic scope of the EIS. A large portion of the construction disturbance would be reclaimed either due to dry holes or for production. Exhibit 2-4, page 2-10, and Sections 2.2.3 and 4.5.3.1 address reclamation. As shown in Exhibit 2-4, once a well goes into production, approximately 2.9 acres of the 5.0-acre construction disturbance would be reclaimed, leaving a residual of 2.1 acres of disturbance for the production well pad. Except for the running surfaces of roads, similar reductions in construction disturbance during the production phase would be attained, arriving at a total long-term production area of disturbance of approximately 5,691 acres. Therefore, the disturbance calculations presented in the DEIS, though perhaps overly conservative, are based on sound reasoning, observations in the field, and information provided by

the Operators. Therefore, no changes to the EIS are necessary or appropriate.

**Comment 11.2.** The statement "... surface use plan with detailed engineering design ..." relates to the requirements of "Onshore Oil and Gas Order No. 1", Section III, G, 4, (2), (9), and 5; the criteria/standards set forth in the *Surface Operating Standards for Oil and Gas Exploration and Development Handbook* (i.e., *the Gold Book*); and other site-specific modifications determined during the onsite inspection conducted during the *Environmental Review* process. DEIS section 2.2.1 has been changed to reflect this clarification. See Section 2 Errata.

**Comment 11.3.** Implementation of a royalty free gravel policy is not within the authority of the State Director. Consideration of this as a recommendation to the Secretary of the Interior will be suggested to the Green River Basin Advisory Committee.

Section 2.2.2.2 Access Road Construction is modified to read "To provide safe operating conditions at all times, roads would be designed to minimize disturbance and would be built, graveled, and maintained as determined appropriate and agreed to by the BLM and the operator at the time of the on-site evaluation." See Section 2 Errata. See response 5.3.

**Comment 11.4.** See response 5.4.

**Comment 11.5.** See response 5.5.

**Comment 11.6.** See response 5.6.

**Comment 11.7.** See response 5.7. The paleontological program does not fall under the National Historic Preservation Act, and is not covered by the Programmatic Agreement for cultural resources. The policies being implemented on assessment and mitigation for fossil resources are designed to promote efficient collection of specimens and data while limiting delays and expenses for project proponents. BLM intends to retain flexibility in its approach to requiring paleontological surveys.

**Comment 11.8.** See response 5.9.

**Comment 11.9.** See response 5.10.



## RESPONSE TO COMMENTS

---

**Comment 11.10.** See responses 5.10 and 5.12. We concur that the statement you cite is confusing and the stipulations that deal with the individual species and their respective time window limitations adds to the confusion.

The CEQ regulations implementing NEPA (40 CFR 1502.14(f), 1502.16(h), and 1508.20) require the identification of all appropriate opportunities to mitigate adverse environmental impacts not already included in the proposed action or alternatives. To not identify the opportunity to develop some type of formal mitigation to offset the long-term loss of an estimated 6,956 acres of breeding and nesting habitat under the Proposed Action or Alternatives, would be neglecting a potentially viable way of ensuring that unnecessary or undue degradation has been minimized to sage grouse.

**Comment 11.11.** See responses 5.13 and 11.1.

**Comment 11.12.** See response 5.14.

**Comment 11.13.** See responses to comments 3.2 and 5.16. Visual resource protection measures such as "appropriate color equipment, low profile tanks, and other measures ..." would reduce the level of visual impact. However, the level of reduction may fail to achieve the Class III VRM standard at a well density of 4 wells per section. Some Class III areas will have sufficient topographic screening to allow 4 wells per section because the well sites would not be visible. Other areas may require directional drilling from a single-pad to extract the resource and comply with Class III VRM standards. The DEIS simply identifies the well density limit that would be necessary to retain the VRM Class II and III management rating. BLM will consider your suggested rewording during the formulation of the Record of Decision.

**Comment 11.14.** See response 5.17.

**Comment 11.15.** See response 6.4. Additional mitigative opportunities are being investigated as a part of the *Moxa Arch Pronghorn Habitat and Livestock Forage Loss Mitigation Plan* that is currently under development by the University of Wyoming FWS Cooperative Research Unit under contract with the BLM and the oversight committee (comprised of energy company contributors, private

landowners, WGFD, and BLM). This plan will explore additional options such as range improvements, development of water sources, and various reclamation techniques as viable mitigative alternatives to offset impacts to pronghorn habitat. The questions raised would be answered as a part of the incremental development of the plan.

**Comment 11.16.** See response 10.6. BLM does not have the authority to specify seed mixes for private or state lands. However, BLM and the Moxa Arch oversight committee (comprised of energy company contributors, private landowners, WGFD, and BLM) have recommended certain seed mixes (see Section 2 Errata). Additionally, BLM will work with private and state interests to reach consensus for appropriate seed mixes.

**Comment 11.17.** See response 10.5. Although BLM is cognizant of the added costs, mulching is a separate issue from seeding. Mulching will be a consideration in difficult areas to reclaim. The primary purpose for mulching is protection of the soil surface from raindrop impact, surface runoff, erosion, and sedimentation. There are some secondary benefits of mulching to plant establishment and growth as well. Mulching is consistent with BLM reclamation policies and provides needed soil protection. This is especially true in the Moxa Arch area where topsoil resources are greatly limited. The effectiveness of mulching in soil protection is demonstrated in the erosion calculations presented in Section 4.5.3.1 (Table 4-7, page 4-23) and in the *Soils and Water Resources Technical Report* (ECOTONE 1995).

**Comment 11.18.** See response to 10.9.

**Comment 11.19.** Photo-monitoring is a simple and quick technique for documenting reclamation success. Under the self-monitoring process being considered by industry, photo-monitoring coupled with a survey report, would be necessary.

**Comment 11.20.** The reason for the increase in percent containment is to ensure sufficient freeboard to avoid potential overflow. The wording in the paragraph on page C-3 is changed to read: "Condensates would be stored in tanks at well locations and centralized facilities, and all tanks will be fenced and surrounded by an impervious dike of



## RESPONSE TO COMMENTS

---

sufficient size to hold the entire storage capacity of the largest tank in the battery and still allow one foot of freeboard. Condensates will be periodically removed ..." See Section 2 Errata.

### WYOMING OUTDOOR COUNCIL

**Comment 12.1.** See responses to Comments 8.1, 8.2, 8.3, and 8.4. Other than air quality, appropriate cumulative impact analysis area(s) for each resource have been identified and the direct, indirect, and cumulative impacts of the expanded Moxa Arch natural gas development have been analyzed as required under the NEPA. The air quality sections of the Moxa Arch DEIS have been expanded to analyze the cumulative impacts of natural gas development on air quality. See Section 2 Addendum.

**Comment 12.2.** BLM, in accordance with regulations of the Council of Environmental Quality (CEQ, 40 CFR 1508.7), has considered the cumulative impact of the Moxa Arch natural gas project and other existing and reasonably foreseeable projects within the area/region affected by the Moxa Arch project. The definition of the region to be analyzed and the scope of the impact statement is left to the discretion of the agency. Also, the BLM is presently conducting the *Southwest Wyoming Resource Evaluation*, the purpose of which is a formal review of BLM land use planning decisions to determine whether present decision-making adequately considers cumulative impacts of development in the region. See responses to Comments 8.1, 8.2, 8.3, and 8.4.

**Comment 12.3.** Although the DEIS does not contain a section that specifically lists the Fontenelle project as a related project (the only project which might be considered related - because it too is a natural gas development project - but not part of the scope of the Moxa Arch project), DEIS Section 3.4.2 Mineral Resources addresses major mineral resources within the analysis area. Exhibit 3-3 shows where some of the adjacent mineral development overlaps with the project area, including the Fontenelle II (DALEN) and Lincoln Road project areas (the Fontenelle EIS area). The socioeconomic (3.14, 4.14) and recreation (3.13, 4.13) sections specifically include consideration of the cumulative effects of other adjacent mineral development activity. Also, the Fontenelle DEIS was

released to the public (the same mailing list for the most part) one week prior to the release of the Moxa Arch DEIS. Their availability was also published in the Federal Register, news papers, and announced on the radio. In addition, the BLM, under the sponsorship and cooperation of Sweetwater County Commissioners and Planning Staff, held a public information meeting on April 22, 1995. The purpose of the meeting was to inform interested publics, and to receive comment from the public, regarding oil and gas development activity occurring or proposed to occur in the near future within Sweetwater County and parts of Lincoln, Uinta, and Carbon Counties, Wyoming. The BLM Rock Springs and Rawlins Districts discussed the following development proposals: Moxa Arch, Fontenelle, Stagecoach Draw, Greater Wamsutter, Mulligan Draw, BTA Bravo, Creston Blue Gap, and Continental Divide. Given the above, BLM feels the intent of NEPA 40 CFR 1501.7(a)(5) has been met. See responses to Comments 8.1, 8.2, 8.3, and 8.4.

**Comment 12.4.** Chapter 1 sufficiently describes how and why the Moxa Arch project area was identified. See responses to Comments 8.1, 8.2, 8.3, and 8.4.

**Comment 12.5.** See responses to Comments 8.1, 8.2, 8.3, and 8.4.

**Comment 12.6.** The major federal action concerns the extensive development of natural gas within the Moxa Arch project area. The associated activities, such as new gravel sources (although existing gravel sources are anticipated to be sufficient to supply the necessary gravel), specific pipeline locations, specific location of the well pad, production facilities, etc., will be addressed in separate environmental documents as explained in DEIS Section 1.4. The required gas processing facilities are described in Chapter 2 of the DEIS. The gas production will be piped through existing ancillary facility infrastructure (DEIS Section 2.2.3.4.). The destination of the gas is often proprietary and is not necessarily identified in the permitting process. Produced water and other hazardous waste will be disposed of at existing Wyoming Department of Environmental Quality permitted facilities. The quantity of produced water estimated is in Appendix C. Geophysical operations are low environmental impact activities and will



## RESPONSE TO COMMENTS

---

require an area specific environmental analysis before any authorization.

**Comment 12.7.** Yes, under FLPMA, BLM is charged with assuring multiple use and sustained yield on public lands. However, this does not mean that every use must occur on every acre of public land. Moxa Arch is recognized as an area of intense oil and gas development but not to the extent of turning all of southwest Wyoming into an industrial landscape. Protective measures are taken to assure preservation of other important resources. However, a member of the public wishing to find complete solitude would need to find an area outside of the Moxa Arch development.

In accordance with FLPMA (Sec. 103 (l) and 202)), management of the public lands within the Moxa Arch project area would occur so that the principal and major uses of grazing, fish and wildlife habitat development and utilization, mineral exploration and development, transportation, outdoor recreation, and rights-of-way, albeit that each would be adversely affected to varying degrees, they would not be eliminated, but would continue to co-exist with the natural gas development. FLPMA (Sec. 103(c)), in its definition of multiple-use, provides for "making the most judicious use of the land for some or all of these resources"; and "the use of some land for less than all of the resources".

BLM policy (FLPMA) obviously differs from the responder's interpretation of what constitutes multiple use and sustained yield. Although the analysis assumes a "maximum" or "worst case" level of development (4 wells per section within the proven production area and 2 wells per section in the flank area), the likelihood that these projected levels of development will be reached is truly remote.

Southwest Wyoming is not to become the Nation's "sacrifice area". Approximately 12.3 % of the public lands in southwestern Wyoming are developed for oil and gas, while numerous large areas within southwest Wyoming remain undeveloped. The transformation of southwest Wyoming "from an open, nearly wild land" began over a century ago. Oil and gas development came to the Moxa Arch project area over 50 years ago. Oil and gas production is part of the history of the region and nearby towns. BLM is currently

analyzing several proposals for infill drilling in the region. Infill drilling--which is defined as more closely spaced drilling of wells within the bounds of an existing oil and gas field--takes advantage of an existing road, pipeline and production infrastructure. Infill drilling maximizes the production from an already developed resource.

**Comment 12.8.** See responses to Comments 6.2 and 6.5.

**Comment 12.9.** The population increases experienced over the past few years in southwestern Wyoming have been a gradual response to increased oil and gas drilling activity among other economic factors (i.e., expansion of trona production). Increased drilling activity occurred when companies attempted to take advantage of favorable tax provisions before they expired in 1992. What is happening now is a continuation of moderate level of drilling activity that has taken place in the area since 1991. The analysis concluded that the drilling and service industry have already adjusted to a higher level of well field development activity than that found during earlier boom periods.

It must be understood that the proposed level of drilling activity for Moxa Arch and the Fontenelle Infill Development represent a continuation of what has been experienced over the last six to eight years. It will not require additional population to maintain a continuing level of development in the area.

The Greater Wamsutter Area II and Creston-Blue Gap projects identified in section 4.14.5 of the DEIS will draw from the drilling and field service industry in eastern Sweetwater, Carbon, and Natrona counties. These projects are not expected to draw additional population into Lincoln, Sweetwater, or Uinta counties.

A thorough analysis of the local tourism and recreation sector was not required for the EIS because they were not identified to be resources of concern in the analysis area (DEIS Section 3.0). As the CEQ regulations state, "... Most important, NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail" (40 CFR 1500.1(b)). However, BLM's Southwest Wyoming Resource



## RESPONSE TO COMMENTS

---

Evaluation will include an assessment of the regional economic benefits of tourism and big game license receipts. No long-term significant impact to big-game populations are expected as a result of the proposed action or alternatives (see pages 4-45 to 4-65 of the DEIS). For this reason, no significant impact on the number of big-game hunting licenses available or big-game hunting activity is expected to occur. Although tourism and recreation may provide an important source of income to the region, very little impact is anticipated to result from the proposed action or alternatives.

**Comment 12.10.** The most recent report on the Solvay mine collapse concluded that it is unlikely that an earthquake triggered the collapse. BLM has consulted with Jim Case of the Wyoming State Geological Survey, and is not aware of new information on seismic risks in the Moxa Arch area referred to in the comment.

The study area lies within Seismic Risk Zone 2B of the Uniform Building Code (UBC), with 0 being the lowest risk and 4 the highest. The effective peak acceleration (percent of gravity) or velocity for Zone 2B would be 0.1g to less than 0.2g. According to the UBC standards, there is a 90 percent probability that the effective peak acceleration would not be exceeded within 50 years. A mitigating measure in the DEIS Section 2.2.4.2.16 Health and Safety (page 2-38) will state that any facilities defined as "critical" by the UBC will be constructed in accordance with applicable UBC standards for Seismic Risk Zone 2B. See Section 2 Errata.

As noted on page 2-32 of the DEIS, the mitigating measures contained in the Amoco Production Company Moxa Arch Natural Gas Production Project Environmental Assessment and Decision Record (USDI, BLM 1991) are applicable to the Proposed Action and Alternatives in the DEIS. Page 71 of the EA states that "An earthquake could potentially damage wells and pipelines if the intensity were severe. Wells and pipelines would be designed and constructed such that moderate earthquakes (intensity VI to VIII on the modified Mercalli scale (Case 1986)) would not damage lines. During high intensity earthquakes, damage to the pipeline may be unavoidable regardless of design considerations. However, the probability of an earthquake occurring

during the life of the project is low." In addition, company contingency plans have been developed for the Moxa Arch project area to mitigate the effects of natural disasters, including earthquakes.

**Comment 12.11.** See response 5.7. Development proposals which would result in significant disturbance to the Green River Formation or Bridger Formation bedrock in areas designated as "High Potential" would be reviewed to determine the need for paleontological survey. Many of those proposals would represent an opportunity to collect surface and subsurface paleontological data. Those opportunities are expected to off-set the possible adverse effects of increased unauthorized collecting of fossils.

The EIS satisfies the requirements of a Class I survey, and further work to mitigate impacts in areas designated as High Potential (Exhibit 3-2, page 3-9) would occur under the Proposed Action and Alternatives. Designating areas as "no surface occupancy", as suggested by the comment, would result in a loss of some of the data that otherwise would be obtained from surveys and monitoring of construction. BLM feels that with the mitigating measures outlined in the DEIS, cumulative impacts to paleontological resources would be insignificant.

**Comment 12.12.** The Kemmerer Resource Area RMP - ROD and Wyoming State approved stipulations for Surface Disturbance Activities includes the statement quoted. However, as shown in Moxa Arch DEIS Appendix A (Standard Mitigation Guidelines and Stipulations for Surface Use), in paragraph 1, sentence 2, the stipulation further states that "... Exception, waiver, or modification of this limitation may be approved in writing, including documented supporting analysis, by the Authorized Officer (AO)." The Kemmerer RMP ROD states that surface disturbance "... will be prohibited unless or until the permittee or his designated representatives and the surface management agency arrive at an acceptable plan for mitigation of anticipated impacts." These provisions suggest that drill sites, roads, and other forms of surface disturbance are possible in Class II areas. The intent of the statement "...any well site development in Class II areas would be considered significant unless screened from view" is to disclose that any drill site in a visible location



## RESPONSE TO COMMENTS

---

would exceed Class II VRM standards and the impact would be considered significant.

The visual resource section of the DEIS strongly supports the importance and value of the scenic quality of the yet undisturbed areas in the Moxa Arch analysis area.

**Comment 12.13.** See response 12.7. A sufficient analysis of the impacts from noise has been completed. Further analysis was not determined necessary for the EIS because noise was not identified as a resource of concern in the analysis area (DEIS Section 3.0). The use of compressors, as stated in DEIS Section 2.2.3.4, would be - "The Proposed Action would utilize the existing ancillary facility infrastructure within the Moxa analysis area where possible, including gas compression facilities..." As stated in DEIS Section 4.12.7, "Implementation of mitigation measures as proposed should fully mitigate or reduce all noise impacts to levels not considered significant." As the CEQ regulations state, "... Most important, NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail" (40 CFR 1500.1(b)). See responses to Comments 8.1, 8.2, 8.3, and 8.4.

**Comment 12.14.** The DEIS references the investigation into reclamation feasibility and success in the Moxa Arch area as presented in both the *Vegetation, Wetlands, and Special Status Plant Species Technical Report for the Moxa Arch EIS Project* (ECOTONE 1995) and the *Soils and Water Resources Technical Report* (ECOTONE 1995). Except for areas where topsoil is totally lacking, positive reclamation feasibility ranging from poor to good was determined. The largest source of reclamation failure is due to poor planning, inadequate reclamation implementation, and either lack of or inadequate performance monitoring. As stated on page 4-25, Section 4.5.5, "Of the total existing disturbance, approximately 13,965 acres are in various stages of reclamation to predisturbance cover conditions." It would be beyond the scope of required analysis and unreasonable to evaluate the status of all reclamation in the area. However, based on the analysis conducted for this EIS, reclamation success is feasible. See page 26 of the *Soils and Water Resources Technical Report* for a summary of

results and Appendix C-4 for quantified data on reclamation success in the Moxa Arch area (ECOTONE 1995).

Refer to DEIS page 4-40, Section 4.8.4, second column, second full paragraph as well as page 65 last paragraph of the *Vegetation, Wetlands, and Special Status Plant Species Technical Report for the Moxa Arch EIS Project* (ECOTONE 1995) for a discussion on the time required for native shrubs and other species to reestablish. Reclamation time frame has clearly been taken into consideration in the EIS analysis.

See response 5.6 regarding road development and transportation plan.

The DEIS text will be changed to reflect that total avoidance of sensitive soils may not be possible given the programmatic scope of the EIS and the lack of site-specific component locations to evaluate (see Section 2 *Errata*). To account for this, the DEIS has taken an environmentally conservative approach by assuming some level of potential impact to sensitive soils will occur. However, it was determined that at least 82 percent of the Moxa Arch analysis area could be developed without significant impact. See Exhibit 3-4, page 3-17 and the large-scale color fold-out map presented in the *Soils and Water Resources Technical Report* (ECOTONE 1995). Section 4.5.6, page 4-28 of the DEIS identifies the procedures to be implemented in planning the avoidance of impact to sensitive soils on the balance of the 18 percent of the analysis area. Development planning in terms of locating project features would avoid sensitive soil areas to the maximum degree practicable.

Professional judgement is a reasonable basis for developing significance criteria. A two percent or 20 percent threshold could have just as easily been used if technical facts warranted. However, there is indication in watershed literature that when total disturbance approaches 10 percent of a watershed, the ability of the watershed to buffer the adverse effects diminishes. Therefore, the 10 percent threshold was applied. The analysis presented in the DEIS is objective and the closeness of 9.7 percent to 10 percent was purely a random result based on objective analysis, not by subjective convenience.



## RESPONSE TO COMMENTS

---

The vast majority of mineral development activity shown in Exhibit 3-3 has already occurred. Where this disturbance overlaps the CIAA, the disturbance has been included in the analysis presented in Section 4.5.5. See the *Soils and Water Resources Technical Report* (ECOTONE 1995) for a description of the methods used to assess existing disturbance. The CIAA will be evaluated to determine if proposed and reasonably foreseeable future actions were adequately included. The primary goal of the Southwest Wyoming Regional Evaluation is to evaluate the cumulative impacts of mineral development in southwest Wyoming. Based on existing knowledge of past, present, proposed, and reasonably foreseeable future actions, the CIAA presented in the DEIS adequately meets NEPA/CEQ requirements.

The Kemmerer RMP and the Moxa Arch DEIS have adequately considered disturbance due to livestock grazing. No commercial logging occurs within the CIAA.

**Comment 12.15.** Response to cultural resources comments are broken down into "a" through "i".

(a) The text has been modified to read: "Thus, 2,871 prehistoric sites/components and 237 historic sites/components have been recorded in the analysis area." See Section 2 Errata.

(b) No Native American religious sites have been identified in the Moxa Arch study area. The requested baseline information about historic trails is not readily available for all known variants within the study area. Compilation of complete baseline information on existing conditions of the trails is not necessary because of the standards by which BLM manage trails (as outlined below). Each undertaking is subject to a case-by-case inventory and review, which documents all baseline information relevant to each project.

(c) Historic trails in the Moxa Arch area are managed in accordance with the guidelines expressed in the documents identified under 12.15(d). Trail segments within the proposed areas of disturbance are evaluated with consideration of their physical conditions, setting, and historical associations. The portions of trails that rank highest in their evaluations are provided the most protection, while segments

evaluated with low rankings due to existing impacts are not afforded the same degree of protection due to compromised historic integrity. Pursuant to these guidelines, trails are crossed using existing ROWs.

(d) The various historic trails in the study area are managed in conformance with our current policy, which was developed pursuant to the *Comprehensive Management and Use Plan, Oregon National Historic Trail*, by the USDI-NPS (August 1981) and the *Oregon/Mormon Pioneer National Historic Trails Management Plan*, by USDI-BLM (May 1986), and the Kemmerer RMP/ROD (June 1986). All future undertakings potentially affecting trail segments will be subject to these plans on a case-by-case basis.

(e) BLM sought comment from all potentially affected Native American groups throughout the NEPA process and in accordance with CEQ and BLM policy and requirements.

(f) A single rock art site was erroneously identified on page 3-81, of the DEIS. There are no rock art sites within the study area and all records have been corrected. See Section 2 Errata.

(g) In order to protect important cultural resources, BLM considers those locations to be confidential and therefore, does not release such information to the public. Area operators have not provided BLM with site-specific locations for proposed project components; thus, BLM can not reach any conclusions at this time about potential impacts to cultural resources.

(h) See response 12.15(g). Section 2.2.4.2.15 of the DEIS provides standard mitigation measures that will be used to avoid causing impacts to historic properties which shall be applied on a case-by-case basis.

(i) BLM is in the process of preparing the Moxa Arch programmatic Agreement. When a draft is completed (June/July 1996), BLM will provide the respondent with a copy for review and comment.

**Comment 12.16.** See Section 4.8.6 for mitigation commitments that includes avoidance of riparian areas and wetlands. Similarly, see Section 4.5.6 for mitigation commitment that includes avoidance of sensitive soils including riparian areas and wetlands.



## RESPONSE TO COMMENTS

---

See response 9.12. The scope of analysis is consistent with a programmatic EIS where the requirement for additional analysis based on site-specific environmental conditions and locations of project features would be accomplished prior to authorization to proceed with construction. BLM and COE will require such analysis before any construction evaluated in this EIS is implemented. In regard to functional value assessment of wetlands see Table 3-13, page 3-35 and the *Vegetation, Wetlands, and Special Status Plant Species Technical Report* for the Moxa Arch EIS Project (ECOTONE 1995). The COE will determine under which permit program project components will be authorized. The COE cannot make a decision pursuant to Section 404 at this time based on the programmatic scope of the DEIS. See Section 4.6 of the *Vegetation, Wetlands, and Special Status Plant Species Technical Report* for a discussion on the planning process and wetlands avoidance. Once the location of specific project features are identified by the Operators and the planing process identified is DEIS Section 4.8.6 and Section 4.6 of the technical report is accomplished, the type of Section 404 permit will be determined by the COE.

An environmentally conservative assessment of potential impacts to wetlands was presented in the DEIS in Section 4.8 and in the technical report. As explained in the response to Comment 12.13 and on DEIS page 4-38 and 4-39, Section 4.8.3.1, the potential for 223 acres of impact is highly unlikely. Thus, the information is available for public review and is adequate for the BLM to make well-informed decisions about the project overall, but not regarding specific project components due to the lack of site-specificity. As discussed above, decisions made by the COE will not occur until site-specific locations are presented by the Operators.

The policy on wetlands avoidance and impact minimization is included throughout the DEIS and supportive documentation. Implementation of avoidance and impact minimization will be the administrative responsibility of the BLM, COE, and the Operators.

Cumulative impacts on wetlands within the Moxa Arch study area and in the greater CIAA were disclosed in Section 4.8.5.

**Comment 12.17.** None of the listed areas will be affected by the Moxa Arch proposed natural gas development.

**Comment 12.18.** Response to wildlife comments are broken down into "a" through "m".

(a) The statement that "[w]ildlife generally, and big game in particular, have been severely impacted by energy and mineral development activities in southwest Wyoming" is offered without documentation or other evidence and would require systematic analysis to prove or disprove. As described in Sections 2.2.4.2.9, 2.2.4.2.10, 4.9.6.1, 4.9.6.2, 4.9.6.3, 4.9.6.4, and 4.9.6.5 of the DEIS, steps are being taken to avoid, minimize, and mitigate potential impacts to wildlife that may be produced by this energy development proposal.

(b) See response to comments 8.8, 8.9, and 8.10. A number of reviewers felt that the cumulative effects analysis on wildlife was deficient. Of particular concern was the contention that impacts were addressed only incrementally and synergistic effects of the proposed project in relation to existing disturbances were not considered. Although cumulative impact assessment has always been an integral part of the NEPA process, only in recent years has the emphasis moved toward more sophistication and refinement in assessing and documenting cumulative impacts. In regard to analysis in the Moxa Arch DEIS, cumulative effects were applied incrementally to give a quantitative measure of the cumulative impact of proposed and existing development in the Moxa Arch area and were based on the best information and techniques available.

Adequate information is not currently available to effectively assess the synergistic effects of development on wildlife. It is very difficult to measure and assess interactive impacts to any ecosystem because of limited understanding and debate regarding how components of a given ecosystem interrelate. These efforts are constantly being refined to improve accuracy and utility. Efforts are being undertaken by BLM in the Southwest Wyoming Resource Evaluation to identify and address cumulative impact concerns. The Green River Basin Advisory Committee is also evaluating how



## RESPONSE TO COMMENTS

---

cumulative impacts are currently being addressed and will provide future direction with respect to techniques for comprehensive cumulative effects analysis, which are likely, to lead to more informed and substantial biological/ecological evaluations in the future.

(c) See response 6.3. The commentator's contentions that death and reduced birth rates will occur in big game species as the result of displacement from crucial winter ranges and that "impacts to wildlife are misrepresented" in the EIS are untrue and misleading. All crucial winter range habitats are protected by BLM restrictions against construction activities from November 15 to April 30 and are open year round for occupancy by animals moving onto and around such range. Studies and observations by BLM and WGFD personnel have noted the habituating tendency of big game species and wildlife in general to oil and gas development activities.

(d) See response 12.7. Impacts to pronghorn crucial winter range will be both short- and long-term, but certainly not permanent as claimed. Reestablishment of crucial winter range will be an on-going process throughout the life of the well field and will, over time, replace lost acreage. All of the loss has been calculated up front, but will in fact take place over the development phase of the project. Reclamation efforts will proceed beginning the first fall after wells go on production and continue up through the retirement of the last active well. Reclamation includes ROWs (i.e., portion of roads not needed and 100 percent of pipelines), partial restoration of active well pads, and total restoration of abandoned well sites. Under the post-reclamation scenario it is assumed that 30 percent of the disturbance is returned to productive antelope habitat within 5 years and the balance returned in 8 to 15 years (required for shrub reestablishment). Post-reclamation disturbance within crucial winter range will be reduced to minimum acres needed for on-going project activities but will remain throughout the 30-year life of production. These remaining areas would be totally reclaimed following abandonment.

(e) The literature suggests that while antelope may initially avoid areas centered around oil and gas activity they eventually habituated to such activity (Segerstrom 1982, Reeves 1984, Alldredge and

Deblinger 1988). O'Gara and Yoakum (1992), found that pronghorn reactions to road related disturbances usually varied in response to traffic volume, but other pronghorn are found immediately adjacent to Interstate Highways that are heavily traveled. The nature of the response may also depend on whether antelope are resident or migratory. Migratory populations that move into an area and encounter new forms of human activities are more likely to initially avoid such activities than resident antelope. The rate at which migratory pronghorn can adapt to disturbance related to the proposed facilities over time is unknown, but the capacity of resident pronghorn to adapt to such circumstances has been demonstrated (Segerstrom 1982, Reeve 1984, Alldredge and Deblinger 1988).

Because no reliable evidence exists that indicates that "migratory pronghorn" do not adapt to human activities, it is not reasonable to conclude in advance that antelope populations in general and oil and gas activity in the Moxa area are incompatible. Conversely, there is much evidence that indicates that given time, pronghorn will adapt to non-lethal forms of human activity, such as oil and gas operations.

As stated in the DEIS (page 2-8), "Some surface locations within the Moxa analysis area may not be feasible to construct and occupy for economic...physical...or other environmental reasons (e.g., areas of crucial winter range). Where economically feasible, the Moxa Operators may use directional drilling from a single-well pad...to access bottom-hole locations in these areas. Generally, BLM would require consideration of using an existing well pad to directionally drill additional wells in sections where site occupancy limitations exist." Exhibit 2-2 has been added to show the approximate location of where the site occupancy limitation areas or sensitive areas are within the Moxa Arch project area subject to directional drilling consideration. See Section 2 Errata.

The emphasis placed on energy development is mandated and directed from the national level, not by BLM, but by the leaders of this great country, the United States of America. The development of natural gas has been identified as the energy of choice by the U.S. Congress and the President. BLM is mandated under the Mineral Leasing Act to provide



## RESPONSE TO COMMENTS

---

for the development of the mineral resource. This is being accomplished, with full public involvement, within the processing framework of FLPMA and NEPA. The development that is occurring and the development proposals being considered are not "illegal,...shortsighted and irresponsible". Rather it is quite legal and responsible.

(f) The number of wells located within the severe winter relief habitat for elk is theoretical and is based on the assumption of equal spacing of total proposed wells. A small portion of the severe winter relief habitat could be affected by oil and gas development. However, limiting disturbance (i.e., limiting the number of well pads, reduced road widths, etc.) will also be applied to prevent unnecessary and undue impacts to these areas.

(g) Some exhibits show a portion of the analysis area extending inside the Seedskaadee National Wildlife Refuge along the Green River. This is incorrect. No part of the Moxa Arch development or analysis area is contained within the Seedskaadee National Wildlife Refuge.

(h) Pronghorn migration and travel corridors are not well enough defined nor strictly enough adhered to by moving animals to justify protection from surface disturbance. All crucial winter range habitats are protected against construction activities from November 15 to April 30 and are open for occupancy by animals moving onto and around such range. The current Moxa Arch Pronghorn Habitat and Livestock Forage Loss Mitigation Plan addresses migration and travel corridors and associated issues.

(i) Mitigation is not being withheld. Without adequate mitigative measures there would be significant, unnecessary and undue, impacts to various species such as antelope and sage grouse. However, the effects of impacts are offset if mitigation and reclamation measures recommended in the DEIS are implemented (see DEIS 2.2.4.2.9, 2.2.4.2.10, 4.9.6.1, 4.9.6.2, 4.9.6.3, 4.9.6.4, and 4.9.6.5).

(j) The use of WGFD population objectives as a criterion for determining significance was based on the Kemmerer RMP (BLM 1986) management objectives. The second stipulation under Section 4.9.2.1 states, *The attainment of WGFD strategic plan*

*population objectives for wildlife will not be jeopardized.* It should be noted that WGFD does not manage game solely in terms of ecological carrying capacity, but rather WGFD population objectives are based on sociologic carrying capacity which is driven largely by a combination of hunter demand, public review and comment, and livestock/agricultural pressures considered in relation to the capacity of the land to support the species in question. See response 9.8.

(k) Unless mandated by law or a project component requires federal approval, BLM has no authority on private lands.

(l) Paragraphs 6 and 7 of Section 2.2.4.2.9, page 2-36 of the DEIS make allowances for raptor nests within a one-mile radius of proposed construction. The inconsistency on page 4-73 (DEIS) has been changed to extend the buffer zone up to one mile around active ferruginous hawk nest. (See Section 2 Errata, DEIS page 4-66 - Section 4.9.6.3 Raptors.)

(m) The following avoidance language has been added to Section 4.9.6.1 of the FEIS: The Wyoming Oil and Gas Conservation Commission (WOGCC) Rules and Regulations (August 1992) require that "Reserve pits shall be completely fenced and, if oil or other harmful substances are present, netted or otherwise secured at the time the rig substructure has been moved from the location in a manner that avoids the loss of wildlife, domestic animals, or migratory birds." For the same reasons, the WOGCC also requires this measure be applied to produced water pits, unless the operator can demonstrate that no harmful chemicals are contained in the fluids.

**Comment 12.19.** Response to water resources comments are broken down into "a" through "m".

(a) The DEIS accurately reflects the BLM's policy on lining reserve pits in the Moxa Arch area. The DEIS, page 4-32, describes the criteria used to determine whether a liner should be required.

(b) It is possible that a pad could be located in proximity to any of these areas. However, based on the impact assessment and mitigation requirements presented in the DEIS, there is little chance that



## RESPONSE TO COMMENTS

---

placement of project components within such areas would be authorized.

(c) Over 95 percent of the reserve pits constructed in the last three years have been lined. Under certain circumstances, reserve pits may not be lined if the soil has a high clay content which would prevent seepage and it would be located away from any drainage where surface water collects. In addition, drilling fluids contain bentonite which also settles into an impermeable barrier in the reserve pit.

(d) Numerous measures have been identified throughout the DEIS to protect against contamination of surface and ground water. Also, contingency plans are required as necessary in accordance with 40 CFR Part 112 to prevent discharge into navigable waters of the United States (DEIS page 2-38). The ROD will identify measures, if appropriate, above and beyond those presented in the DEIS, that would apply to Seedskafee NWR. In general, most lands adjacent to the NWR are administered by the BOR.

(e) DEIS Section 3.6 summarizes all available baseline water quality data for the project area. The BLM, in conjunction with the State Engineers Office and the Wyoming Oil and Gas Conservation Commission, could require the development of a surface and groundwater quality monitoring program specific to this proposal, if deemed necessary, to verify the DEIS conclusion of no significant impacts. This monitoring opportunity has been added to the FEIS. See Section 2 Errata.

(f) See DEIS Section 2.2.2.4 and Exhibit 2-11 for details for cementing well bores. Also see response 23.5.

(g) See response 23.5. BLM and WOGCC determine cementing requirements.

(h) BLM, in consultation with industry, is studying the occurrence and potential severity of corrosion of well casings and the impacts upon groundwater. High quality casing and cathodic protection are two measures currently implemented to remediate potential problems. Section 2.2.3 of the DEIS details well completion and testing operations to ensure protection of groundwater and avoid corrosion problems. The FEIS text has been modified to clarify the casing,

cementing, and cathodic protection measures. See Section 2 Errata.

(i) There are a couple of deep injection wells within the Moxa Arch project area. These are located on fee lands. They are permitted and administered by the Wyoming Department of Environmental Quality. They are used to dispose of produced water.

(j) See DEIS discussion on page 4-33 regarding Onshore Oil and Gas Order No. 2 pertaining to well casing and cementing requirements. The casing and cementing policy applied to the Moxa Arch projects is required by the WOGCC on fee and state minerals the same as BLM on federal minerals. See DEIS page 2-23.

(k) One NPDES discharge permit exists within the Moxa Arch project area - Exxon's Shute Creek Plant. No new permits are anticipated. No pollutants are being discharged. No violations have been reported.

(l) The BLM documents violation of environmental laws and regulations under two categories - undesirable events and incidences of non-compliance. Recordation of such events within the Moxa Arch project area is included in Section 2 Errata under Section 3.4.2, page 3-8.

(m) The DEIS, Sections 4.5.6, 4.6.6, and 4.8.6, and Appendices A, B, and C provides information on best management practices.

**Comment 12.20.** See response 4.2, 4.3, and 4.4. An *Air Quality Technical Support Document - Cumulative Impact Analysis of Southwestern Wyoming Natural Gas Development Projects on Air Quality* has been prepared and is summarized in the FEIS. This analysis examines the cumulative impacts of wellfield construction as well as production operations. To the extent that other airsheds are impacted by emissions from Moxa Arch and Fontenelle, these impacts have been quantified. The analysis includes the impacts of existing and reasonably anticipated emissions sources within the region of southwest Wyoming.

The effects of PM10 concentrations are assessed in Table 4-2 of the DEIS. The maximum modeled PM-10 concentrations are compared with Wyoming Ambient Air Quality Standards, and found to comply



## RESPONSE TO COMMENTS

---

with these ambient standards. The magnitude of the ambient standards was derived to be protective of human health, so that demonstration of compliance with the Wyoming Ambient Air Quality Standards ensures protection of human health.

The acidification of watersheds is addressed in the DEIS, with findings summarized in Table 4-4. All impacts are found to be smaller than "significant" impact levels, indicating that no adverse acid deposition effects are expected. The change in visibility is addressed by running the VISCREEN model, as discussed in section 4.2.3.3 of the DEIS. The Technical Support Document analysis re-examines the acid deposition and visibility issues for full cumulative impact.

A Prevention of Significant Deterioration (PSD) analysis is not required of "minor" sources, such as the wellsite construction activity discussed in the DEIS. The Wyoming DEQ, Air Quality Division, has provided more recent background concentration data collected at the Seedskaadee National Wildlife Area, and at the Craven Creek Site (Memorandum from Mr. B. Dailey, Engineering Supervisor, to Mr. C. Collins, Administrator, WDEQC, September 22, 1995). These background data are summarized in the Technical Support Document.

**Comment 12.21.** Road density standards are a management prescription whose definition and development for the BLM Kemmerer Resource Area is outside the scope of this EIS. Existing as well as new transportation plans would identify existing and proposed roads and roads slated for closure. Moxa Arch operators have already closed and reclaimed roads within the project area. Also, one of the objectives of the Moxa Arch Pronghorn Habitat and Livestock Forage Loss Mitigation Plan is to identify existing roads not needed for production operations or for livestock operations that can be reclaimed. Under the Moxa Arch Proposed Action the road density would be approximately 3.6 miles/square mile and under Alternative A approximately 3.2 miles/square mile. This calculation includes all existing roads within the project area, including public roads (i.e., Highway 30, and I-80), collector roads, local roads, resource roads, and unimproved roads.

**Comment 12.22.** As stated in the DEIS (page 2-1), based upon the current understanding of the natural gas reservoir characteristics, a maximum development level of four wells per section is deemed appropriate for most of the Moxa analysis area. Although there may be areas with below-average recovery of gas reserves that may justify well densities of five to eight wells per section, there will also be areas of below-average recovery of gas reserves that may not justify development at all. Thus there will be sections with no wells. The Moxa Operators reasonably expect that the proven productive area would be developed at an average level of four wells per section or 610 additional wells within the ten-year planning period. The important factor is that the total number of wells analyzed for are not exceeded within the proven productive area, within crucial antelope winter range, etc. If the levels analyzed for are reached, then a supplemental EIS will be required to analyze the effects of development up to that point in time and the cumulative effects of more intensive development.

**Comment 12.23.** Inspection and enforcement monitoring occurs daily within the project area. This monitoring by BLM personnel is conducted to ensure compliance with the permits issued and the Operating Orders. Monitoring of such resources as water quality, reclamation, erosion control, recreation use, wildlife use, livestock grazing, etc., occurs as BLM staff can fit them into the budget and their limited schedules. Industry self-monitoring is therefore becoming a more likely possibility and is currently being tested within certain BLM districts.

**Comment 12.24.** See response 12.7. Oil and gas development is allowed for and in conformance with federal, state, and local land use plans. Oil and gas development often occurs in fields, leaving vast areas surrounding these fields in a "natural setting." Recreational opportunities still exist throughout the resource area, including the Moxa Arch field. However, if someone is looking for complete solitude, recreating within the Moxa Arch field will not provide for that experience.

Air Quality within the Moxa Arch field and southwest Wyoming is within federal and state standards. No violations of the Clean Air Act have occurred. BLM can not authorize any activity that would violate these standards.



## RESPONSE TO COMMENTS

---

Seedskaadee National Wildlife Refuge will not be affected by the development in the Moxa Arch project area. No development is proposed within or adjacent to the Refuge.

**Comment 12.25.** According to 43 CFR 1502.14, BLM is required to look at all reasonable alternatives based upon what is practical and feasible. The United States is dependent upon domestic and foreign energy sources. It is U.S. policy to develop domestic energy sources where practical. This requires development of federal energy reserves located on public lands. However, development of domestic energy reserves is not done at the cost of other important resources. Protective measures are required so that when those federal energy reserves are depleted, disturbed areas will eventually recover to predisturbance levels. Oil and gas reserves are stationary; to develop them, the operator must go to where they exist.

Energy development on some public lands in Wyoming is a foregone conclusion. However, as stated above, the entire area of southwestern Wyoming will not be developed for oil or gas. Presently approximately 12.3 % of the public lands in southwestern Wyoming are developed for oil and gas, while numerous large areas remain undeveloped. BLM is currently analyzing several proposals for infill drilling in the region. Infill drilling--which is defined as more closely spaced drilling of wells within the bounds of an existing oil and gas field--takes advantage of existing road, pipeline and production infrastructure. Infill drilling maximizes the production from an already developed resource.

**Comment 12.26.** To the contrary, BLM and its legal council have on several occasions attempted to show the WOC where their argument is in error (e.g., Bravo, HS Resources, Stagecoach Draw, and Wamsutter II decisions). While recognizing limits on its authority, BLM has analyzed the impacts of a No Action Alternative. Impacts of implementing the No Action Alternative were analyzed for each potentially affected resource (see subsections labeled "No Action Alternative" in DEIS Chapter 4).

The comment misrepresents the intent of the actual text of the DEIS. In the DEIS Section 2.4 (page 2-39), BLM recognizes that it has a legal obligation under NEPA to consider the No Action Alternative:

"Section 1502.14(d) of the National Environmental Policy Act (NEPA) requires that the alternatives analysis in the EIS "include the alternative of no action.'" The DEIS considers the No Action Alternative pursuant to 40 CFR Part 1502.14(d). Following in Section 2.4, BLM recognizes and informs the public that: "The U.S. Department of the Interior's (USDI) authority to implement a "No Action" alternative is limited." This is not the same as saying that the No Action Alternative need not be considered. Similarly, the responder is aware of the legal questions that would surround an interpretation that BLM has unlimited authority to implement this alternative. Consequently, the No Action Alternative is considered for each affected resource and for the infill drilling project. The responder has not identified any specific errors, omissions or oversights in the analysis of the No Action Alternative. BLM does not grant any oil and gas operator an unfettered ability to place as many wells as it chooses in a field.

Also, the No Action Alternative, meaning no leasing or development, was analyzed during the planning process which incorporated full public participation. The Kemmerer RMP ROD identified these lands as available for leasing and thus, development. This was also concurred in by the State and local governments. Therefore, a true No Action Alternative in this case would be contrary to and not in conformance with federal, state, and local land use plans. The respondent is correct that infill drilling is not legally mandated. However, drainage of federal energy reserves is illegal and not in the best interest of the American people. A 12.5 percent royalty is collected on federal energy reserves and not allowing development on certain federal lands could cause drainage of federal reserves without payment of federal royalties. The respondent may not agree with energy development on federal (or private lands for that matter) but the royalty collected funds local infrastructure, lowers individual taxes, and helps reduce U.S. dependence upon foreign energy supplies.

**Comment 12.27.** See response 5.12, 9.3, and 11.13. The Proposed Action and Alternative incorporate directional drilling to reach target bottomhole locations where necessary to avoid sensitive surface resources such as wetlands, historic sites, etc., or to reduce unnecessary surface disturbance within crucial winter ranges, Class II viewsheds, etc. BLM will



## RESPONSE TO COMMENTS

---

require the operator/lessee to consider directional drilling in areas of sensitive surface resources or to drill from an existing pad where four well pads already exist within a section.

In order to directionally drill, certain conditions must be met including formation characteristics, depth of the formation, etc. Where feasible, BLM may mandate directional drilling in areas where there are sensitive resources (i.e., steep slopes, crucial habitat, etc.). However, the proper conditions must be met in order for this drilling technic to be an effective alternative. It makes little sense to require directional drilling if the conditions can not be met.

It would cost a company \$60,000-65,000 or more to directionally drill a well to replace one conventional well with a directional well drilled from an existing well pad to avoid surface disturbance caused by new road-pipeline construction. Based on the results of the analysis conducted by the BLM Wyoming Reservoir Management Group for the Fontenelle projects area, it is apparent that a *blanket* requirement of directional drilling from an existing pad where four well pads already exist within a section is not a reasonable alternative. Forced directional drilling would mean that a number of wells would not be drilled and thus a resource wasted. It would be more prudent and economical to invest a fraction of the cost (e.g., 10%) to drill a directional well into other measures that would reduce resource impacts. These measures could include placing pipelines adjacent to access roads but outside the borrow ditch and reducing the zone of vegetation disturbance during pipeline installations; reclaiming old seismic trails or other two-track trails and other roads not necessary for oil and gas field operations or other uses; comingling production facilities to reduce the size of well pads remaining during production; installing remote-sensing equipment to monitor wells to reduce the number of trips to each well from daily to about twice per week; etc.

Since the Moxa Arch Proposed Action and Alternative A would drill an average of four wells per section, an alternative that includes directional drilling as a blanket requirement is not considered reasonable. However, directional drilling would still be a required consideration on a case-by-case basis in the sensitive

surface resource value areas shown in Exhibit 2-2. See Section 2 [Errata](#).

**Comment 12.28.** An energy conservation alternative was not considered necessary nor appropriate. Development and production of the natural gas resource is driven by the market and public demand for the resource. The pace of development and production is regulated by use within the United States. Until the U.S. Government prescribes an energy policy, including conservation of the resource, BLM has no authority to stipulate that members of this society conserve energy resources. Therefore, an analysis of an energy conservation alternative is not practicable nor feasible.

**Comment 12.29.** The Proposed Action and Alternative A have resource protection incorporated in them. VRM Class II and III areas, historic trails, crucial wildlife habitat, etc., are all afforded protection. Additional mitigation has been identified and may be added as protection measures in the Record of Decision. Oil and gas activities are not proposed for Seedskaadee National Wildlife Refuge.

**Comment 12.30.** See response 5.6, 5.17, 8.8, 9.13, 9.20, 10.6, 12.11, 12.14, 12.15, and 12.16.

**Comment 12.31.** The Park Service and the Forest Service were sent copies of the DEIS and are on the mailing list.

**Comment 12.32.** See response 8.2.

**Comment 12.33.** See response 8.2, 8.8, 8.9, 12.7, and 12.24. Although an influx of people into the region who work in the energy industry may be a factor, it is also a result of affluent people leaving urban areas (i.e., CA, NY, etc.) for a more rural lifestyle or wanting to recreate in rural/primitive areas. Also, increased recreation on National Forests as well as BLM lands is considered by some to be a result of the "babyboom" generation attitudes toward the environment, outdoor experiences, the ability to afford the equipment, etc. When one walks or drives around most communities, you see a lot of travel trailers, boats, etc. This phenomenon is not strictly a result of increased employment in the oil and gas industry in southwest Wyoming -- rather it is happening all over the western U.S.



## RESPONSE TO COMMENTS

---

**Comment 12.34.** It is not necessary nor appropriate to include the conflict of interest disclosure form in the EIS. BLM and the consultant have complied fully with the provision of 40 CFR 1506.5(c). Although the DEIS was prepared by a third party consultant, that consultant works under the supervision of BLM and the document must comply with BLM standards. Additionally, the document is the property of BLM and BLM is solely responsible for its scope and content.

**Comment 12.35.** All operators are required to have one of three types of bond - \$5,000 lease bond, \$25,000 state bond, or \$150,000 nationwide bond. If an operator fails to comply with permit conditions, BLM can correct the action under the bond. If a bond has to be activated to correct an action of noncompliance, the operator cannot continue to operate (depending on the type of bond) on the lease, within the state, or within the nation until the bond is paid-up.

### NATIONAL WILDLIFE FEDERATION

**Comment 13.1.** See responses 8.1 and 8.2.

**Comment 13.2.** The scope of the Moxa Arch DEIS is adequate and does not violate NEPA. See response 8.3, 12.1, 12.2, and 12.3 for explanation.

**Comment 13.3.** The Moxa Arch DEIS does not fail to identify and adequately evaluate impacts based upon land ownership. Table 1-3 provides surface ownership of the Moxa Arch analysis area. The projected number of wells, as stated in Table 2-1, is the total within the Moxa analysis area (regardless of land ownership). As the Council on Environmental Quality has directed, the analysis of direct, indirect and cumulative impact from an action should be conducted without regard for land ownership. However, it is essential to factor in land ownership when considering mitigating opportunities. The DEIS has done this.

The analysis of environmental consequences explains on page 4-1, Mitigation Summary - that "... Mitigation items specified in the Mitigation Summary are *assumed to be* applicable to impact on all lands, regardless of ownership". However, under Residual Impacts - because "... the Moxa analysis area is

comprised of a "checkerboard" of federal, state, and private lands, mitigation cannot be required by BLM on state and private lands. ... The degree of implementation of these measures on non-federal lands cannot be predicted or evaluated at this level of analysis. ... Some discussion is provided in regard to differential application of mitigation and resultant impacts under each resource discipline section."

**Comment 13.4.** See responses 8.1 and 8.2.

**Comment 13.5.** See response 12.25, 12.26, 12.27, and 12.28.

**Comment 13.6.** See response 12.26.

**Comment 13.7.** See response 12.25, 12.26, 12.27, 12.28 and 12.29. BLM cannot mandate directional or horizontal drilling on private lands; it can only recommend that it be done. BLM does have the authority to require directional or horizontal drilling when circumstances warrant. BLM will require the other measures (e.g., lining of reserve pits, reinjection) when needed on a case-by-case basis.

**Comment 13.8.** The DEIS does conclude that with the implementation of the proposed mitigation measures, as well as the additional measures identified in Chapter 4, impacts on most resources would be reduced to levels not considered significant - unnecessary and undue impacts would have been eliminated. However, adverse residual impacts would remain to visual resources and wildlife. See response 12.18.

**Comment 13.9.** See response 12.20. The threshold level identified in Table 4-1, page 4-6 of the DEIS, is the federal EPA's "significant" level of emissions. For new major sources subject to PSD review, pollutants emitted in amounts greater than the "significant" levels must be analyzed for PSD impact. The wells are not by themselves subject to PSD review, nor are any of the emission rates shown in Table 4-1 greater than the "significant" levels.

**Comment 13.10.** See Appendix E of the *Soils and Water Resources Technical Report* (ECOTONE 1995). As can be discerned from DEIS Table 4-7, page 4-23, erosion rates in Year 5 with erosion controls would be at or below the tolerance level of 2 tons/acre/year.



## RESPONSE TO COMMENTS

---

The tolerance level is for long-term erosion, not for erosion in any given year due to variability from year to year. Further, revegetation does not become fully effective in erosion control for 3 to 5 years after implementation. Therefore, Year 5 with erosion control is the most appropriate value to utilize in making such a determination. The impact assessment in this section assumes the guidelines in Appendix B will be effectively implemented. For whatever reason, if these guidelines are not implemented, significant soils impacts could occur. Refer to paragraphs 3 and 4, page B-1, DEIS Appendix B for more information.

Table 4-8, DEIS, page 4-27, identifies a total of 50,179 acres of existing disturbance within the CIAA. Most of this area is comprised of past and present industrial activities. Cumulative impacts are assessed for all lands, not just public.

Requirements outlined in the RMP are applicable to operations on public land and have not been waived with respect to Moxa Arch operators. See DEIS, Sections 4.5.2.1, 4.5.2.2, 4.6.2.1, 4.6.2.2, 4.8.2.1, and 4.8.2.2; and the *Vegetation, Wetlands, and Special Status Plant Species Technical Report for the Moxa Arch EIS Project* (ECOTONE 1995), Sections 4.2 and 4.3; and the *Soils and Water Resources Technical Report* (ECOTONE 1995), Section 4.1.2. The Kemmerer RMP was taken into consideration. See DEIS, Exhibit 2-5, page 2-11, and Section 2.2.2.1, page 2-8, for information on directional drilling and the use of multiple well pads. There would be additional adverse impacts of raised pipelines that would likely be of greater magnitude (i.e., visuals, wildlife, health and safety) than the proposed buried pipelines.

**Comment 13.11.** Yes, all wells are to be cased. The DEIS (page 2-23) states that "Well completion operations involve the placement and cementing of well tubing in compliance with Onshore Order No. 2. Well casing involves running steel casing pipe into the open borehole and cementing the pipe in place. A typical completed (cased) well bore diagram for a vertical well within Moxa is shown in Exhibit 2-11." (DEIS page 2-26.)

**Comment 13.12.** See response 12.19(a-d).

**Comment 13.13.** See response 12.18 (m). BLM policy requires any pits, whether emergency, reserve, or produced water, be maintained in a manner that will prevent migratory bird mortality.

**Comment 13.14.** The DEIS (page 4-79), Special Status Fish, does provide water resource depletion associated with the project.

**Comment 13.15.** See responses 9.12, 9.13, and 12.16.

**Comment 13.16.** Response to wildlife impacts comments are broken down into "a" through "j".

(a) In order to mitigate the total amount of crucial winter pronghorn range eliminated by construction and operation of the proposed wells within this habitat, Moxa Arch operators are advised to participate in the *Moxa Arch Pronghorn Habitat and Livestock Forage Loss Mitigation Plan* that is currently under development to identify specific opportunities for reducing impacts from oil and gas development on pronghorn antelope, other big game species, and livestock. This plan is being developed by the University of Wyoming FWS Cooperative Research Unit under contract with the BLM and the oversight committee (comprised of energy company contributors, private landowners, WGFD, and BLM).

(b) The DEIS is not a decision document. The DEIS at 4-48 identifies other opportunity to reduce impacts. In the Record of Decision, BLM may require directional drilling or multiple-well pads where appropriate. The current proposal is to restrict the number of well pads in sensitive areas (i.e., may limit to four pads/section in winter range, raptor nesting areas, sage grouse leks, Oregon Trail, threatened/endangered species, and less than four pads in Class II & III VRM areas).

(c) See response 12.18(a-j).

(d) See response 13.16(a).

(e) See response 6.5 and 13.16(a). The *Moxa Arch Pronghorn Habitat and Livestock Forage Loss Mitigation Plan* specifically addresses off-site mitigation.



## RESPONSE TO COMMENTS

---

(f) See response 12.18(k). BLM can only recommend that protective measures be applied to private lands. However, the overall severity of adverse impacts will be offset to the extent possible with implementation of the mitigation and reclamation measures outlined in the DEIS (see Sections 2.2.4.2.9, 2.2.4.2.10, 4.9.6.1, 4.9.6.2, 4.9.6.3, 4.9.6.4, and 4.9.6.5).

(g) See response 9.8 and 12.18(j).

(h) See response 12.18(e) and 13.16(a).

(i) See response 8.8, 8.9, and 8.10.

(j) See response 8.8, 8.9, and 8.10. In addition to field surveys conducted in the spring and summer of 1994, current Wildlife Observation System (WOS) and Wyoming Natural Diversity Database (WYNND) information was used in assessing the identification and distribution of various endangered, threatened, and candidate wildlife species relative to the analysis area. These sources of information represent primarily incidental observations made by WGFD personnel while performing other tasks and are not the result of comprehensive surveys or studies. Therefore, this information was used only as an indication of the relative distribution of certain wildlife species and not as an index of overall population trend. Whether the frequency of sightings of a particular species is closely correlated with population levels is highly debatable. The frequency of sightings is determined not only by the number of animals in a given area, but also by other factors such as the size of the area involved, deductibility level of individual species, and the amount of effort expended by the observer. Thus, one cannot conclude in advance that developmental activities in the Moxa area are responsible for the perceived decline in certain wildlife species.

**Comment 13.17.** See responses 3.3, 6.2, and 6.5. It is unlikely that a ban on hunting activities within the Moxa Arch field would be enacted unless there was some type of catastrophic event such as an extremely harsh winter/spring or disease that caused a mortality rate much higher than normally expected. WGFD has the flexibility to implement measures as needed.

**Comment 13.18.** The mitigation measures outlined in the DEIS and as modified in the FEIS are not "vague statements of good intentions." These measures are designed to minimize to the extent possible all unnecessary and undue adverse impact to resource values. See responses 6.4, 8.5, 12.18(k), and 13.16(f).

### U.S. DEPARTMENT OF THE INTERIOR - BUREAU OF RECLAMATION

**Comment 14.1.** As for the Fontenelle project EIS, the Bureau of Reclamation was notified at scoping and has been involved from the initiation of the Moxa Arch project EIS. Mr. Dave Krugar of the Bureau of Reclamation office was the contact. Dave reviewed the DEIS and provided comments, including the *BOR Stipulations for Surface Use, Oil and Gas well Drill Sites, and Access Roads* that appear in Appendix A of the DEIS. Your additional comments have been considered in drafting the FEIS. An address correction has been made to ensure proper delivery of the FEIS.

**Comment 14.2.** Any drilling activity on public lands administered by the BOR will be subject to BOR requirements including no directional drilling under the Fontenelle Dam. This measure will be added as number 16 to the BOR stipulations in Appendix A. See Section 2 [Errata](#).

**Comment 14.3.** Fontenelle Reservoir is shown in DEIS Exhibit 3-5, page 3-21, Table 3-7, page 3-20, and in the *Soils and Water Resources Technical Report* (ECOTONE 1995).

**Comment 14.4.** See response 12.19(d, e, f, h, and j) and 23.5.

**Comment 14.5.** See response 14.3. Fontenelle Reservoir will not be impacted by Moxa Arch development. It is outside the area of immediate impact. However, BOR will be directly involved in any considerations of applications for permit to drill (APDs) on BOR lands. This will assure proper consideration for Fontenelle Dam protection.

**Comment 14.6.** See response 14.3.



## RESPONSE TO COMMENTS

---

**Comment 14.7.** See responses 5.1, 12.19 (f and g), and 13.11. As the DEIS points out (page 2-23), wells drilled in the Moxa analysis area will adhere to one or more of the four requirements for casing/cementing to ensure the protection of fresh water and guard against corrosion.

**Comment 14.8.** See response 14.3. BOR stipulations for drilling were not provided to BLM. Please provide them for inclusion in the Record of Decision.

### STATE OF WYOMING - OFFICE OF THE GOVERNOR

**Comment 15.1.** Thank you for your comment. The DEIS has identified reasonable mitigation measures for management consideration in the Record of Decision.

**Comment 15.2.** See response 4.3. A *Technical Support Document Addendum* is included with the FEIS that examines the cumulative impacts to air quality, including acid deposition, resulting from oil and gas operations (including compression, natural gas dehydration, condensate liquids handling, and other gas/liquid processing).

### STATE OF WYOMING - OIL AND GAS CONSERVATION COMMISSION

**Comment 16.1.** Thank you for your comment. The reason for the difference in number of wells (321 v. 628) is that the 321 pertains to the Moxa analysis area as it was defined in 1993, i.e., only the area north of I-80. The balance of the wells in 1993 were located south of I-80.

### STATE OF WYOMING - DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER QUALITY

**Comment 17.1.** The DEIS has been corrected to add your suggestion. See Section 2 Errata. See response to comment 12.19(c).

**Comment 17.2.** Any hydrostatic test water discharge will also be coordinated with WDEQ-WQD. The DEIS is corrected at page 2-35. See Section 2 Errata.

**Comment 17.3.** Measure 16 page 2-35 has been corrected. See Section 2 Errata.

### STATE OF WYOMING - DEPARTMENT OF ENVIRONMENTAL QUALITY - AIR QUALITY

**Comment 18.1.** See response 15.2. The emission rates of CO, hydrocarbons/VOCs, NO<sub>x</sub> and HAPs associated with routine wellfield operations have been computed and are presented in the supplemental document entitled *Air Quality Cumulative Impact Analysis Technical Report Addendum* (Technical Support Document) that examines the cumulative impacts of wellfield operations. See Section 2 Addendum.

**Comment 18.2.** The supplemental document entitled *Air Quality Cumulative Impact Analysis Technical Report Addendum* (Technical Support Document) has been prepared that examines the cumulative impacts on air quality of both the Moxa Arch and Fontenelle fields, and other developments such as Stagecoach and Jonah projects, existing power plants, trona plants, portions of the I-80 corridor, and railroad traffic. Emission sources which are not located in the Moxa Arch-Fontenelle-Stagecoach-Jonah area have also been included in the cumulative modeling effort (including Greater Wamsutter, Mulligan Draw, Creston-Blue Gap, Dripping Rock, Hay Reservoir, and BTA Bravo). A summary of the technical analysis conclusions is contained in Section 2 Addendum and Appendix A of this FEIS.

**Comment 18.3.** Depending upon the size of the other facilities, Wyoming DEQ Air Quality Division permits would have to be granted prior to construction of most of the compression, flaring, and other facilities. These permits to construct would not be granted by the Air Quality Division without a showing that such construction and operation of these facilities would not jeopardize ambient air quality standards and other air quality criteria. The correction to DEIS Table 1-4 has been made. See Section 2 Errata.

**Comment 18.4.** Worst case additional compressor facilities have been analyzed in the supplemental document entitled *Air Quality Cumulative Impact*



## RESPONSE TO COMMENTS

---

*Analysis Technical Report Addendum*. See Section 2 Addendum and Appendix A.

**Comment 18.5.** Burning of commercial garbage and any other open burning has been added to Table 1-4. See Section 2 Errata.

**Comment 18.6.** To the extent that dust suppressants are needed to maintain compliance with ambient air quality standards, dust suppressants will be used. This authorizing action has also been added to Table 1-4. See Section 2 Errata.

**Comment 18.7.** This information has been corrected and has been analyzed in the supplemental document entitled *Air Quality Cumulative Impact Analysis Technical Report Addendum*. See Section 2 Addendum and Appendix A.

**Comment 18.8.** See response 8.12.

**Comment 18.9.** Table 3-3 is corrected. See Section 2 Errata.

**Comment 18.10.** The construction and production phase emission of air pollutants, generators, and other fired equipment required for drilling have been corrected and have been analyzed in the supplemental document entitled *Air Quality Cumulative Impact Analysis Technical Report Addendum*. See Section 2 Addendum and Appendix A.

**Comment 18.11.** See response 18.10.

**Comment 18.12.** See response 18.10.

**Comment 18.13.** See response 18.10.

### STATE OF WYOMING - DEPARTMENT OF COMMERCE - DIVISION OF CULTURAL RESOURCES

**Comment 19.1.** The forthcoming document, People of the Sage, 10,000 Years of Occupation in Southwest Wyoming, by K.W. Thompson and J.V. Pastor of Archaeological Services of Western Wyoming Community College (1995) was sent to SHPO on July 7, 1995, with a request for comments. No written response was provided.

On August 16 and 17, 1995, Archaeologists from the Rock Springs District met with J. Wolf and T. Thibodeau of SHPO to begin discussions of the proposed terms of the Moxa Arch Programmatic Agreement and is still under development. BLM hopes to have a final agreement by June 30, 1996.

### STATE OF WYOMING - WYOMING GAME AND FISH DEPARTMENT

**Comment 20.1.** See response 12.18 (a-e, and h). Because no list of literature citations was submitted with your comments, it is not possible to respond to your reference to and comments concerning Reeve (1995). Any analytical procedure utilized to determine significance of impacts to pronghorn will ultimately be based on professional opinions and we feel that the ones used in this analysis are as valid as any and better than most currently available.

**Comment 20.2.** See response 13.16(a). The pronghorn mitigation plan will address specific habitat improvement opportunities. Impact Significance Criteria are not used to define whether mitigation is needed. Rather they are used to help determine the context and intensity of impacts upon wildlife from the action under analysis.

**Comment 20.3.** See response 9.8 and 12.18(j).

**Comment 20.4.** See response 8.2, 8.3, and 8.4.

**Comment 20.5.** See response 6.4, 11.6, 12.18(k), 13.3, and 13.16(f).

**Comment 20.6.** See response 6.4, 11.15, 12.18(k), 12.21, and 13.16(f).

**Comment 20.7.** If oil and gas development occurs as described in the Moxa Arch Proposed Action or at the reduced level described in Alternative A, the corresponding reduction in carrying capacity of affected pronghorn herd units is a consequence or trade-off of that development. Mitigation, including voluntary off-site mitigation, as the *Moxa Arch Pronghorn Habitat and Livestock Forage Loss Mitigation Plan* is in the process of identifying, will provide some opportunity to reduce the impact to the herds. However, aside from denying development, no



## RESPONSE TO COMMENTS

---

reasonable mitigation is likely that would maintain carrying capacities as they currently exist.

**Comment 20.8.** See response 6.2.

**Comment 20.9.** See response 6.2.

**Comment 20.10.** See response 12.18(d).

**Comment 20.11.** See response 6.4, 11.15, 12.18(k), 12.21, 13.16(f), and 20.7.

**Comment 20.12.** See response 6.4.

**Comment 20.13.** The DEIS has addressed "best management practices". DEIS Appendix B provides detailed reclamation and monitoring guidelines that will be considered for implementation. See response 12.19(m).

**Comment 20.14.** Thank you for your comment. BLM has held reclamation forums in the past. Technology exchange is extremely important. A workshop specific to the Moxa Arch and Fontenelle project areas is an excellent suggestion.

**Comment 20.15.** Regarding mitigation, the purpose of the EIS is first, to identify mitigation and monitoring that is committed to by the proponent as part of their proposed action, including what is required by law. Secondly, the EIS identifies further opportunities for mitigation and monitoring to avoid or reduce resource impacts. BLM is responsible for seeing that the mitigation is implemented. The Record of Decision (ROD) will be specific as to who is responsible for the actual implementation of the mitigation. All avoidance, mitigation, and monitoring procedures contained in and approved in the ROD will be enforceable and executable.

**Comment 20.16.** Thank you for providing the aquatic/fisheries information. It will be incorporated into the FEIS. See also response 6.4 and 20.15, as well as Sections 2.2.4.2.6, 2.2.4.2.7, 4.10.4, 4.10.5, 5.2.4, and Appendices A and B of the DEIS. See Section 2 Errata.

### STATE OF WYOMING - WYOMING STATE GEOLOGICAL SURVEY

**Comment 21.1.** Thank you for your comment.

**Comment 21.2.** See response 12.10. A mitigating measure has been added to the DEIS and states: "Any facilities defined as *critical* by the Uniform Building Code will be constructed in accordance with applicable Uniform Building Code Standards for Seismic Risk Zone 2B." In addition, operators in the Moxa Arch have developed contingency plans to deal with natural disasters, including earthquakes.

### STATE OF WYOMING - PUBLIC SERVICE COMMISSION

**Comment 22.1.** Thank you for your comment.

### U.S. ENVIRONMENTAL PROTECTION AGENCY

**Comment 23.1.** See responses 4.1, 8.1, 8.2, 8.3, 8.6, 8.9, 8.10, 8.11, 12.2, 12.3, and 12.5.

**Comment 23.2.** EPA is correct in that the Southwest Wyoming Resource Evaluation (SWRE) will not be completed within the time frames of this analysis. However, as noted in response 23.1, the cumulative effects of the Moxa Arch development have been fully analyzed in conformance with NEPA and CEQ Regulations. Oil and gas authorizations do not need to stop and wait for the SWRE to be completed.

**Comment 23.3.** BLM concurs in the use of all available measures in the current proposals to reduce ground disturbance. To the extent economically and physically feasible, directional or horizontal drilling will be encouraged in areas of sensitive resource values. We are encouraged by the Performance Review Teams recommendation for royalty relief to encourage drilling practices that cause minimal surface disturbance.

**Comment 23.4.** See response 12.14. Regardless of land ownership, reclamation is occurring on lands in the same manner. The primary difference is in the seed mix. The private land owner does not want plants such as sagebrush included in the seed mix on his private land. So the assumption of 72% reclamation is not unrealistically high.



## RESPONSE TO COMMENTS

---

**Comment 23.5.** The current cementing policy resulted from a collaborative effort between WOGCC, PAW, operators, and BLM. Prior to the current policy, BLM mandated cementing of production casing from TD (total depth) to surface. This policy raised many concerns with industry and resulted in a case study in which over 70 wells were tested, their history reviewed, and the data analyzed. Based upon these findings, an amended policy was agreed to (as stated in the DEIS, page 2-23, paragraph 5). BLM feels the compromised reach is an effective alternative requiring no further changes to the document.

**Comment 23.6.** The DEIS has been corrected as suggested. See Section 2 Errata.

**Comment 23.7.** This DEIS has been modified to include reference to the information listed. See response 12.19(m) for best management practices included in the DEIS. See Section 2 Errata.

**Comment 23.8.** See response 9.12, 9.13, and 12.16.

**Comment 23.9.** Thank you for your recommendation. BLM believes the DEIS and FEIS include practicable impact avoidance measures and mitigation to replace unavoidably lost functions. The ROD will specify required application.

**Comment 23.10.** See response 20.15. The ROD will specify what mitigation and monitoring is a "requirement" and what is intended as a "guideline".

**Comment 23.11.** In most cases, construction, drilling, and reclamation practices are the same or similar on private and state land as on federal lands. However, BLM continues to work with the operators on additional measures to reduce impacts on private lands such as painting facilities to blend in with background, seasonally restricting construction or drilling activity that can impact big game or upland game use, etc. BLM will continue to work with industry to reduce adverse impacts on private lands. However, BLM has no authority to mandate these measures be applied on private lands.

**Comment 23.12.** The respondent has misread and/or misinterpreted the text. The text says: "At the third year of monitoring, undesirable species should comprise no more than 15 percent of the total vegetal

cover." An operator is responsible for controlling all undesirable noxious plants that may invade the reclamation.

**Comment 23.13.** BLM has supplemented the DEIS with additional analysis regarding air quality cumulative impacts and other errata corrections and changes. BLM believes that the standards for construction, drilling, reclamation, and production operations, coupled with the mitigation measures and monitoring requirements, will afford the necessary protection of the environment within the intent of NEPA, FLPMA, and other laws and regulations. BLM believes that EPA will find there remains no unresolved environmental concerns or insufficient information.







**APPENDICES:**

**APPENDIX A**

**APPENDIX B**







## APPENDIX A:

# Summary/Table of Contents for the Air Quality Cumulative Impact Analysis Technical Report Addendum







## EXECUTIVE SUMMARY

This Technical Support Document analyzes the cumulative air quality impacts of natural gas development at eight proposed natural gas developments:

- Moxa Arch Field
- Fontenelle Reservoir
- Stagecoach Draw
- Jonah Prospect Field
- Mulligan Draw
- Creston/Blue Gap
- BTA/Bravo Field
- Greater Wamsutter Area II

The purpose of this analysis is to determine the cumulative air quality impacts of pollutant emissions from all of these well fields together, coupled with the impacts of existing air pollutant sources in the vicinity, and with existing background air pollutant concentrations.

In reviewing this document it is important to understand the assumptions that have been made regarding resource development. In development of this analysis there is a great deal of uncertainty in the projection of specific plans (i.e. number of wells, equipment to be used and specific locations) for resource development for 20 years in the future. All of these factors affect air emissions as well as predicted air quality impacts. This analysis was based on the "worst case": 1) amount of development; 2) equipment necessary to produce the resource to its maximum capacity; 3) well spacing; and 4) assumed source locations. This emission scenario represents an upper bound which would not be exceeded. Review of current production activities in the area suggests that this level of air emissions and impacts would not be reached. Thus the impacts projected in this report should be viewed as a conservative upper bound estimate of potential air quality effects that are not likely to occur. It is also important to note that before development could occur, the Wyoming Department of Environmental Quality would require very specific air quality preconstruction permits which must examine project specific air quality effects. As part of these permits, (depending on source size), WDEQ would require a cumulative air quality impacts analysis. Thus, as development occurs additional site specific air quality analysis must be performed to ensure preservation of air quality resources.

The methodology in this Technical Support Document consists of several sequential steps.

First, well construction and operation scenarios were defined. These scenarios identified data which is needed to quantify pollutant emissions. These data include expected spacing, location, and number of wells; duration of construction and production activities; sizes and specifications of equipment that would be used during well drilling and operation, etc. Where there was uncertainty in specification, the general approach has been to estimate construction and operation sequences that would maximize air pollutant emissions, thereby ensuring that air quality impacts are not underestimated.

Second, the expected pollutant emission rates of proposed well field projects were calculated, using U.S. EPA emissions data and factors, as well as data provided by industry. This compilation of expected pollutant emissions, called the "emission inventory", quantifies the expected emissions that would occur if all of the projected well fields were constructed and operated. In this sense the emission inventory portrays a maximum, or "worst-case", indication of total pollutant emissions. Two distinctly different types of air quality analyses are required -- one a quantification of nearby effects (compliance with National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) increments), and the other an analysis of so-called "far field" impacts (visibility impairment, atmospheric deposition, and ozone formation). Consequently, different emissions scenarios were developed for single well emissions and for total well field emissions.

Third, the acquisition of representative meteorological data and existing background concentration data that characterizes the southwestern Wyoming environment. Because the well fields will be significant emitters of nitrogen dioxide (NO<sub>2</sub>), a special air quality model run was made to simulate the transport and dispersion of NO<sub>2</sub> from existing major NO<sub>x</sub> sources in southwest Wyoming. The findings of this model run were used to provide a



Fourth, the meteorological data were used, in conjunction with the emissions inventories, to predict the maximum localized pollutant concentrations in the vicinity of the wells, and to calculate the pollutant concentrations at sensitive locations in the PSD Class I Bridger-Teton Wilderness area.

The fifth, and last sequential step, was the computation of potential impacts to Air Quality Related Values (AQRVs) in the Bridger-Teton PSD Class I area were made to quantify the impact of well field development on atmospheric deposition at sensitive lakes, and to compute the expected reduction in visual range (regional haze) caused by the proposed well development.

The findings of this cumulative analysis are as follows:

- The construction and operation of the eight well fields identified in this analysis would meet all applicable National Ambient Air Quality Standards (NAAQS) and Wyoming Ambient Air Quality Standards (WAAQS).
- Emissions expected from the eight proposed natural gas developments would comply with applicable Prevention of Significant Deterioration Class I and Class II Increments.
- Pollutant concentrations during production activity did not "overlap" from one well to adjacent wells, even with the densest assumed well spacing. That is, the maximum ground-level concentrations from one well occurred at locations sufficiently close to the well that adjacent wells contributed insignificant concentrations to the overall maximum concentration.
- The impact of construction and operation of the eight proposed natural gas developments is below applicable significance criteria for atmospheric deposition within the Bridger-Teton Wilderness area. Computations of atmospheric deposition indicate that there will be no significant degradation of water quality even under "worst-case" emissions scenario.
- The modeled impact of the Moxa Arch, Fontenelle, Stagecoach Draw, and Jonah proposed natural gas developments examines impairment to visual range within the Bridger-Teton Wilderness area. Assuming a "worst-case" emissions scenario, only 8 days of the non-winter and 18 winter days are predicted to cause any perceptible visual range reduction; under the "less conservative" emissions scenario, no days exhibit visual range reduction.



## TABLE OF CONTENTS

|   |             |
|---|-------------|
| EXECUTIVE SUMMARY   | Page i      |
| 1.0 INTRODUCTION  | Page 1 - 1  |
| 2.0 EMISSIONS INVENTORY<br>AND MAXIMUM EMISSIONS SCENARIOS                | Page 2 - 1  |
| 2.1 CONSTRUCTION EMISSIONS  | Page 2 - 1  |
| 2.2 PRODUCTION EMISSIONS  | Page 2 - 8  |
| 2.3 MAXIMUM CUMULATIVE EMISSIONS SCENARIO                                 | Page 2 - 9  |
| 2.3.1 Total Well Field Emissions  | Page 2 - 9  |
| 2.3.2 Individual Well Emissions   | Page 2 - 10 |
| 2.3.2.1 Particulate Matter  | Page 2 - 10 |
| 2.3.2.2 Carbon Monoxide   | Page 2 - 11 |
| 2.3.2.3 Sulfur Dioxide  | Page 2 - 11 |
| 2.3.2.4 Nitrogen Dioxide  | Page 2 - 11 |
| 2.3.2.5 Hazardous Air Pollutants  | Page 2 - 12 |
| 2.4 ALTERNATE COMPRESSOR OPERATING SCENARIO                               | Page 2 - 13 |
| 2.5 NO <sub>x</sub> MITIGATION  | Page 2 - 13 |
| 2.5.1 NONSELECTIVE CATALYTIC REDUCTION                                    | Page 2 - 15 |
| 2.5.2 PRESTRATIFIED CHARGE  | Page 2 - 16 |
| 2.5.3 LEAN COMBUSTION   | Page 2 - 16 |
| 2.5.4 SELECTIVE CATALYTIC REDUCTION                                       | Page 2 - 17 |
| 2.5.5 EXHAUST GAS RECIRCULATION   | Page 2 - 17 |
| 3.0 EMISSIONS INVENTORY - OTHER SOURCES                                   | Page 3 - 1  |
| 3.1 SOURCES IDENTIFIED IN<br>OTHER ENVIRONMENTAL IMPACT STATEMENTS        | Page 3 - 1  |
| 3.2 NO <sub>x</sub> SOURCES PERMITTED BUT NOT CONSTRUCTED                 | Page 3 - 4  |
| 4.0 REPRESENTATIVE METEOROLOGY<br>AND BACKGROUND POLLUTANT CONCENTRATIONS | Page 4 - 1  |
| 4.1 METEOROLOGY   | Page 4 - 1  |
| 4.2 BACKGROUND POLLUTANT CONCENTRATIONS                                   | Page 4 - 1  |
| 5.0 AIR QUALITY MODELING  | Page 5 - 1  |
| 5.1 NEAR FIELD MODELING   | Page 5 - 1  |
| 5.1.1 CONSTRUCTION IMPACTS  | Page 5 - 3  |
| 5.1.1.1 PARTICULATE MODELING  | Page 5 - 3  |
| 5.1.1.2 SULFUR DIOXIDE  | Page 5 - 6  |
| 5.1.2 PRODUCTION PHASE  | Page 5 - 7  |
| 5.1.2.1 CARBON MONOXIDE   | Page 5 - 8  |
| 5.1.2.2 NITROGEN DIOXIDE  | Page 5 - 8  |
| 5.2 HAPS MODELING   | Page 5 - 9  |
| 5.2.1 SHORT TERM EXPOSURE   | Page 5 - 11 |
| 5.2.2 LONG TERM EXPOSURE  | Page 5 - 12 |



|       |  |             |
|-------|--|-------------|
| 5.3   | OZONE MODELING   | Page 5 - 13 |
| 5.4   | NO <sub>2</sub> AND SO <sub>2</sub> FAR FIELD MODELING | Page 5 - 14 |
| 5.4.1 | EMISSION SOURCES                                       | Page 5 - 15 |
| 5.4.2 | RECEPTORS  | Page 5 - 16 |
| 5.4.3 | DEPOSITION   |             |
|       | AND CHEMICAL TRANSFORMATION                            | Page 5 - 16 |
| 5.4.4 | MODELING RESULTS                                       | Page 5 - 17 |
| 5.5   | WATERSHED CONCENTRATIONS                               | Page 5 - 17 |
| 5.6   | VISIBILITY   | Page 5 - 19 |
| 6.0   | AIR QUALITY RELATED VALUES                             | Page 6 - 1  |
| 6.1   | WATERSHED DEPOSITION                                   | Page 6 - 1  |
| 6.1.1 | BACKGROUND ACIDIC DEPOSITION                           | Page 6 - 1  |
| 6.1.2 | COMPUTED DEPOSITION                                    | Page 6 - 3  |
| 6.2   | VISIBILITY   | Page 6 - 5  |

## REFERENCES

|             |  |             |
|-------------|--|-------------|
| Figure 1.1  | Cumulative Impacts Study Area                | Page 1 - 3  |
| Figure 2.1a | Schedule of Well Pad/Road Construction       | Page 2 - 3  |
| Figure 2.1b | Schedule of Rigging/Drilling                 | Page 2 - 4  |
| Figure 2.1c | Schedule of Completion/Testing               | Page 2 - 5  |
| Figure 4.1  | Windrose (Craven Creek)                      | Page 4 - 2  |
| Figure 4.2  | NO <sub>x</sub> Background Contour Plot      | Page 4 - 5  |
| Figure 5.1  | Well Pad Site and Resource Road              | Page 5 - 4  |
| Figure 5.2  | NO <sub>x</sub> Concentration Isopleths      |             |
|             | Showing No Overlap                           | Page 5 - 10 |
| Figure 5.3  | Wind Trajectory Plot                         | Page 5 - 20 |
| Figure 6.1  | Deciview Plots: Worst Case Scenario          | Page 6 - 9  |
| Figure 6.2  | Deciview Plots:                              |             |
|             | Less Conservative Scenario                   | Page 6 - 10 |
| Table 2.1a  | Total Emissions From                         |             |
|             | Well Site Construction (spreadsheet)         | Page 2 - 6  |
| Table 2.1b  | Emissions in tpy                             | Page 2 - 7  |
| Table 2.2   | Summary of Individual Well                   |             |
|             | Production Emissions                         | Page 2 - 8  |
| Table 2.3   | Maximum Annual Average Emissions             |             |
|             | from Total Well Field                        |             |
|             | Construction and Production                  | Page 2 - 10 |
| Table 2.4   | Applicability and Performance of             |             |
|             | NO <sub>x</sub> Controls on Pipeline Engines | Page 2 - 14 |
| Table 2.5   | Estimated Cost Effectiveness of              |             |
|             | NO <sub>x</sub> Controls                     | Page 2 - 15 |
| Table 2.6   | NO <sub>x</sub> Engine Emissions             | Page 2 - 15 |
| Table 3.1   | Summary of Other Sources Considered          |             |
|             | in the Cumulative Impact Analysis            | Page 3 - 2  |



|            |  |             |
|------------|--|-------------|
| Table 3.2  | Summary of the Number of Wells and Associated Emissions for Other Well Fields Included in the Cumulative Impact Analysis | Page 3 - 3  |
| Table 3.3  | WDEQ Identified Sources to be included in the Modeling   | Page 3 - 5  |
| Table 4.1  | Monitored Background Concentrations  | Page 4 - 3  |
| Table 4.2  | NO <sub>x</sub> Sources Modeled for Estimating NO <sub>2</sub> Background Contribution                                   | Page 4 - 4  |
| Table 5.1  | Ambient Air Quality Standards  | Page 5 - 2  |
| Table 5.2  | EPA PSD Significant Levels   | Page 5 - 2  |
| Table 5.3  | Maximum Modeled Particulate Concentrations   | Page 5 - 5  |
| Table 5.4  | Maximum Modeled SO <sub>2</sub> Concentrations   | Page 5 - 6  |
| Table 5.5  | Maximum Modeled CO Concentrations  | Page 5 - 8  |
| Table 5.6  | Maximum Modeled NO <sub>2</sub> Concentrations   | Page 5 - 9  |
| Table 5.7  | HAP Modeling Results Acute Exposures   | Page 5 - 11 |
| Table 5.8  | HAP Modeling Results Long-Term Exposure  | Page 5 - 13 |
| Table 5.9  | Maximum Modeled 1-Hour Ozone Concentration   | Page 5 - 14 |
| Table 5.10 | Maximum Modeled NO <sub>2</sub> Concentration at Class I Wilderness Area   | Page 5 - 17 |
| Table 5.11 | Maximum Annual Average NO <sub>2</sub> and SO <sub>2</sub> Concentrations at Sensitive Lakes                             | Page 5 - 18 |
| Table 6.1  | Chemical Characteristics and Values of Sensitive Lakes   | Page 6 - 2  |
| Table 6.2  | Chemical Characteristics and Computed Values of Sensitive Lakes  | Page 6 - 4  |
| APPENDIX 1 | COMPUTATION OF WELL PAD CONSTRUCTION EMISSIONS   |             |
| APPENDIX 2 | COMPUTATION OF WELL PRODUCTION EMISSIONS   |             |
| APPENDIX 3 | NO <sub>2</sub> EMISSION INVENTORY   |             |
| APPENDIX 4 | VOC/NO <sub>x</sub> POINT SOURCE SCREENING TABLES  |             |
| APPENDIX 5 | ATMOSPHERIC DEPOSITION   |             |
| APPENDIX 6 | VISIBILITY COMPUTATIONS  |             |







**APPENDIX B:**  
**Road Development Plan**

FOR THE  
ARIZONA ARCH AREA







ROAD DEVELOPMENT PLAN  
FOR THE  
MOXA ARCH AREA







**ROAD DEVELOPMENT PLAN  
FOR THE  
MOXA ARCH AREA**

**TABLE OF CONTENTS**

| <u>Section</u>                                  | <u>Page</u> |
|---|-------------|
| Purpose   | 1           |
| General   | 1           |
| Transportation Planning                         | 2           |
| Design and Route Location                       | 4           |
| Construction/Quality Control                    | 7           |
| Maintenance                                     | 7           |
| Road Density Management                         | 7           |
| <br><u>Exhibits</u>                             |             |
| Post Construction Inspection Record             | 8           |
| Typical Roadway Details                         | 12          |
| Typical Drainage Details                        | 13          |
| Typical Cattleguard and Gate Installation       | 14          |
| Cattleguard Foundation (Timber)                 | 15          |
| Cattleguard Foundation (Precast Concrete)       | 16          |
| Cattleguard Foundation (Cast-In-Place Concrete) | 17          |
| Cattleguard Installation for R/W Fence          | 18          |
| Access Permit - Wyo. Dept. of Trans.            | 19          |
| Access Permit - Lincoln Co.                     | 22          |
| Access License - Sweetwater Co.                 | 26          |
| Access License - Uinta Co.                      | 28          |







**MOXA ARCH OPERATORS**  
---  
**ROAD DEVELOPMENT PLAN**  
**FOR THE**  
**MOXA ARCH AREA**

**PURPOSE**

This document is intended by the Moxa Arch Operators as a commitment to a quality assurance/quality control program for the location, design, construction and maintenance of roads required for expansion of their operations on public lands within the Moxa Arch Area. The contents of the following sections will detail the procedures by which transportation planning, road design, road construction and road maintenance will be conducted by the Moxa Arch Operators to meet their operational needs and Bureau of Land Management requirements for roading standards, safety and resource protection.

**GENERAL**

The Moxa Arch Operators utilize an extensive road network in the Moxa Arch Area, much of which is shared with other road users. Planned expansion of their operations, when implemented, will result in the need for additional road construction.

Present Bureau of Land Management requirements for transportation planning and the location, design and construction of roads are intended to provide an adequate road system for development and use of natural resources. Protection of the environment and user safety are also considered in the design of the roads.

To achieve these objectives in the course of conducting their operations, the Moxa Arch Operators propose to implement a quality control and assurance program for roads. This program will allow the Moxa Arch Operators to determine the road construction they will need for their operations in the foreseeable future, set up the standards and parameters necessary for the location, design and construction of these roads, and provide for post-construction compliance monitoring.

The construction of safe and environmentally acceptable roads will be one of the Moxa Arch Operators' priorities within the Moxa Arch Area. The Moxa Arch Operators will make every effort to provide for the safe and environmentally sound location, survey, design and construction of roads on public lands within the Moxa Arch Area. Company personnel, the BLM and the affected counties, with the involvement of registered engineers and land surveyors, will ensure all plans and construction meet safety and environmental requirements.



## TRANSPORTATION PLANNING

The Moxa Arch Operators propose to implement a three-tiered process for transportation planning, with appropriate levels of planning, implementation and quality assurance included within the three tiers.

The three levels of transportation planning will be as follow:

### **LEVEL 1 - TRANSPORTATION PLAN**

The Transportation Plan for the Moxa Arch Area will consist of Transportation Plan Maps (with supplemental narratives), and this Road Development Plan. These documents, plus the Annual Road Plans and Project Plans explained below, will guide the overall long term development of a road network to serve the operations of the Moxa Arch Operators in the Moxa Arch Area.

#### Planning

Transportation issues relating to the Moxa Arch Area are also addressed in Sections 3 and 4 of the Expanded Moxa Arch Natural Gas Development Environmental Impact Statement. Those Sections (which are broad in scope and recognize the overall needs and effects of the Moxa Arch Operators' proposed actions within the area) address major arterial routes (state and county) which will be used to reach the area. They also discuss some BLM administered Collector and Local (BLM functional classification) roads which will be used to reach areas of the field(s) and the environmental effects of the construction and surface disturbances related to roads in the area. An estimate of traffic associated with the development of the Moxa Arch Area that will use these routes is also included in the environmental effects discussion.

The Moxa Arch DEIS Exhibit 2-1 (DEIS page 2-3) displays existing main routes (state, county and BLM administered roads) presently used for access in or near the Moxa Arch Area. These, as well as other field roads and proposed roads needed for field development, will be studied by the Moxa Arch Operators to determine which routes should be designated as Collector, Local and Resource (BLM functional classification) routes to form a useable transportation system for field development and access to the area. Transportation Plan Maps (with supplemental narratives) will then be prepared. The supplemental narratives will address projected traffic for each route, realignment and reconstruction necessary for safety or environmental reasons, and planned new road construction.

There is a possibility that the present and future development of a road network associated with the Moxa Arch Area will lead to development of recreational or home sites on private land parcels near or within the Moxa Arch Area. The Moxa Arch Area is comprised of public lands interspersed with private and state owned lands, particularly along the Union Pacific railroad lines, where a "checkerboard" land ownership pattern exists. If privately owned parcels within the Moxa Arch Area were to be developed for recreational or home sites, segments of field roads on public lands could become the primary access to these parcels. Coordination between the BLM and the affected counties concerning jurisdictional and improvement responsibility for these routes may be needed to avoid subdivisions or other developments served by BLM roads.

This Road Development Plan describes the process by which route planning, location, design, construction, quality control, maintenance and road density management will be accomplished by the Moxa Arch



Operators during the expansion of their operations within the Moxa Arch Area. Other information relating to engineering design such as soils, drainage, grades, problem areas on existing or proposed roads, anticipated traffic volume and vehicle weights, the need for gravel or other treatment to stabilize road surfaces, and coordination to meet county or state requirements will be addressed on a case-by-case basis for each road and during the annual review process.

### Implementation

This Road Development Plan will be used to guide the Moxa Arch Operators' road system planning and development process. The Transportation Plan will be further refined to keep it current and to provide project specific information as described in Level 2 and Level 3 which follow.

## **LEVEL 2 - ANNUAL ROAD PLAN**

### Planning

An Annual Road Plan which will address road needs on a quadrangle by quadrangle basis within the Moxa Arch Area will be prepared each year in conjunction with the Moxa Arch Operators' annual drilling programs.

The Annual Road Plan will show roads which have been constructed, existing routes to be improved as local and collector roads, and new roads to be constructed in the specific region(s) of the Moxa Arch Area where operations are planned for the following year. Roads scheduled for abandonment within the Moxa Arch Area will also be shown on the plan. Changes in access routes (both proposed and already constructed) necessitated by terrain, environmental factors and other reasons, will also be shown on the Annual Road Plan.

Proposed roads shown on the Annual Road Plan will be located and designed to meet the standards for the appropriate BLM functional classification.

The Annual Road Plan will be updated and submitted to the BLM for review each year, before development of the roads included in it is begun.

## **LEVEL 3 - PROJECT PLANS**

### Planning

Each Project Plan will include one or more USGS quadrangles as appropriate to display the Moxa Arch Operators' planned road construction program for the area(s) where development is occurring.

It will show existing and planned roads by functional classification within each quadrangle and will be prepared as needed while each company's drilling program is being implemented. When an APD (Application for Permit to Drill), NOS (Notice of Staking) or application for a right-of-way is submitted, a copy of the Project Plan will be included to show other wells and access roads proposed in the area. Road construction plans for one or more roads may be submitted with each project plan as part of the NOS, APD or right-of-way application.



## DESIGN AND ROUTE LOCATION

### Implementation

Before routes are selected and road plans are prepared, Moxa Arch Operator(s) personnel and their surveying/engineering consultants will review this road development plan and any available resource and land use data from BLM or other sources specific to the project area. A joint BLM (engineer, resource specialist), operator, and consultant field review will then be scheduled and conducted. Depending upon the number of roads or complexity of a single road, the joint review team will determine the most feasible access route(s) based on the resource conflicts, soils, drainage considerations, terrain and engineering standards for the type of route planned. During the field review, the degree and scope of engineering and construction control required will be specifically defined.

### New Roads

"New" roads, as referred to in this plan, are roads to be constructed where no "crowned and ditched" road has previously been built, except in the case where one may have been built and later obliterated or rehabilitated. Roads to be constructed on routes which follow existing "seismic" or "two-track" trails will still be considered "new" roads.

Location, design and construction of all new roads in the Moxa Arch Area will be to the standards derived from BLM Manual 9113. The Moxa Arch Operators will use the road standards shown on the following page in the Moxa Arch Area unless conditions dictate otherwise.

### Existing Roads

A road referred to in this Road Development Plan as an "existing" road is one which has previously been constructed to a standard which required a crowned travelled way and borrow and drainage ditches (except for some roads in the fields which were built without ditches, but met BLM requirements at the time they were constructed). "Seismic trails" and existing "two-track trails" are not considered existing roads.

Existing roads which are classified as resource roads in the Annual Road Plan will not normally be upgraded or reconstructed, unless it is determined they were not constructed as directed by the BLM at the time they were built.

Existing roads which are identified in the Transportation Plan and/or Annual Road Plan as being part of a Local or Collector route will be reconstructed or upgraded (improved) as necessary to meet the current standards for the appropriate functional classification.



---

**ROAD STANDARDS FOR THE MOXA ARCH AREA**

| <b>DESIGN ELEMENT</b>  | <b>FUNCTIONAL CLASSIFICATION</b> |                          |                              |
|--|----------------------------------|--------------------------|------------------------------|
|  | <b><u>Resource Road</u></b>      | <b><u>Local Road</u></b> | <b><u>Collector Road</u></b> |
| Design Speed   | 20 MPH(max.)                     | 30 MPH                   | 40 MPH                       |
| Width (travelled way)  | 14 ft.*                          | 20 ft.(min.)             | 24 ft.(min.)                 |
| Width (subgrade)   | 18 ft.                           | 24 ft.(min.)             | 28 ft.(min.)                 |
| Min. Horiz. Curve Rad.   | 220 ft.                          | 460 ft.                  | 820 ft.                      |
| Maximum Grade  | 8%                               | 8%                       | 8%                           |
| Minimum Grade  | 0.5%                             | 0.5%                     | 0.5%                         |
| Min. Stopping Sight Distance   | 135 ft.                          | 225 ft.                  | 325 ft.                      |
| Min. Intersection Sight Distance   | 200 ft.                          | 300 ft.                  | 400 ft.                      |
| Min. R/W Width Needed<br>(construction on steep slopes will increase the R/W width needed) | 50 ft.                           | 55 ft.                   | 60 ft.                       |
| Design Structural Loading  | H-20                             | H-20                     | H-20                         |

\* With turnouts

---



## Route Location

During the joint field review, routes will be selected that avoid unnecessary resource conflicts whenever possible. The placement of the road relative to migration corridors, ridge lines, and other areas known to be used by big game animals will be considered. Routes should be located to avoid adverse effects to threatened, endangered and other plant and animal species of interest.

During the location of roads, particular attention will be given to meeting or exceeding the minimum vertical and horizontal sight distances required. Route locators/surveyors will also select horizontal curves to ensure that the minimum radius requirements for the planned design speed are met or exceeded.

Geometric combinations of vertical and/or horizontal curves (such as reverse horizontal curves, broken back curves and horizontal curves superimposed over vertical curves), which create dangerous situations for road users, will be avoided.<sup>1</sup> When the terrain is such that these combinations cannot be completely eliminated, signs to warn motorists or other mitigation measures will be incorporated into the road plans.

The centerline and locations of structures will be staked, color coded and clearly marked for all new roads, including those designed and constructed on steep, broken or mountainous terrain.

Construction staking will be done for roads or segments of roads where the engineer/surveyor determines that slope staking for the control of construction is necessary because of terrain, grade and earthwork conditions and/or special construction needs (structures and other features).

## Road Plans

All new roads and appurtenances (such as culverts, cattle guards, fences, etc.) will be constructed to the dimensions, slopes and details shown on the attached templates, unless agreed otherwise because of conditions or circumstances (see Exhibits, pages 12 thru 18).

Surfacing specifications and depths shown on the attached templates may be adjusted because of local soil conditions, or graveling of roads may be waived (with BLM agreement) in instances where gravel is not available or is not considered necessary. Dust abatement mitigation with soil treatment additives will be considered on a case by case basis and at the annual review.

Plans for all roads will show the horizontal and vertical alignment of the road and the locations of culverts and other features. Typical sections needed to show the road template, culvert installations, and other features will also be attached. Cross-sections of the roadway and other drawings for special design features will be included as needed.

Road designs submitted by a registered civil engineer will bear the stamp and signature of the engineer when submitted to the BLM for review.

Road plats and plans prepared by a registered land surveyor (these will require the participation of a BLM engineer during the route selection phase) will bear the stamp and signature of the land surveyor, and a

---

<sup>1</sup> Refer to the BLM Pocket Field Guide "Road Standards-Excerpts from BLM Manual Section 9113."



statement that the alignment, grade and other features shown on the plans accurately depict the field conditions surveyed, including the route and features as actually staked in the field. Roads designed by a registered engineer and surveyed by a registered land surveyor will bear the stamp and signature of the engineer, and may bear the stamp and signature of the surveyor when necessary.

Plans for construction of all roads will be submitted to the BLM for review and acceptance by the District Engineer.

### **CONSTRUCTION/QUALITY CONTROL**

All roads constructed or reconstructed by the Moxa Arch Operators within the Moxa Arch Area will be built to the approved plans, and will comply with all other applicable requirements and stipulations. The construction will be monitored by Moxa Arch Operators' company representatives, their consultants, or an independent construction inspector as required.

Any changes which may become necessary during construction will be jointly agreed to by the BLM, the designer, affected private landowners, and the involved Moxa Arch Operators company representative before construction of the changes commences. The agreed to changes and the reasons they are necessary will be documented in writing with copies distributed to all parties.

Within five days after construction of each road is completed, it will be inspected by company personnel, the contractor who performed the construction, and the BLM (at their option). This inspection will be documented on a "Post Construction Inspection Record" form (see exhibit, pages 9 thru 11) and signed by those performing the inspection. Any work which does not comply with the approved plans will be immediately corrected by the contractor.

A registered civil engineer's certification that the construction was completed according to the approved road plans will generally be furnished for those roads that were designed by a registered professional engineer.

### **MAINTENANCE**

Road maintenance will be conducted as required by existing and future grants and permits. Joint use maintenance agreements among the operators in the Moxa Arch Area will remain in effect. If needed, changes in the agreements may be negotiated at the option of the involved parties.

### **ROAD DENSITY MANAGEMENT**

Road abandonment and rehabilitation will be performed as required by the BLM in cases where constructed roads are determined to be no longer needed. Roads slated for abandonment will be shown on the Annual Road Plan. Roads that are determined by the BLM to be of substantial value for access to other resources, for administrative access or for county access needs, will be identified for placement on the BLM or county road system. These roads will be shown on the Annual Road Plan with their appropriate new designation as soon as it is known.



This page intentionally left blank.



# MOXA ARCH OPERATORS

## POST CONSTRUCTION INSPECTION RECORD for Road Construction

Company: \_\_\_\_\_

Project Name: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Weather: \_\_\_\_\_

Contractor: \_\_\_\_\_

C o n s t r u c t i o n  
Superintendent: \_\_\_\_\_

### CONSTRUCTION CHECKLIST

| <u>General</u>                                      | YES | NO | N/A |
|---|-----|----|-----|
| Does the project look good?                         | —   | —  | —   |
| Are sight distances to standards shown on plans?    | —   | —  | —   |
| Is it comfortable to drive at design speed?         | —   | —  | —   |
| Will drainage system take all water away from road? | —   | —  | —   |
| Are curves constructed as shown on plans?           | —   | —  | —   |
| Has topsoil been replaced on slopes?                | —   | —  | —   |
| Have disturbed/work areas been rehabbed/cleaned up? | —   | —  | —   |
| <br><u>Roadway Template</u>                         |     |    |     |
| Are these features as shown on plans?:              |     |    |     |
| Cut and fill slopes                                 | —   | —  | —   |
| Shoulder slopes                                     | —   | —  | —   |
| Subgrade width                                      | —   | —  | —   |
| Gravel surface width                                | —   | —  | —   |
| Gravel surface depth                                | —   | —  | —   |
| Borrow ditch depth                                  | —   | —  | —   |



Drainage

YES NO N/A

Are culverts damaged or obstructed?

\_\_\_ \_\_\_ \_\_\_

Are these as shown on plans?:

Culvert locations

\_\_\_ \_\_\_ \_\_\_

Culvert lengths and diameters

\_\_\_ \_\_\_ \_\_\_

Inlet basins and ditch blocks

\_\_\_ \_\_\_ \_\_\_

Wing and drain ditches

\_\_\_ \_\_\_ \_\_\_

Riprap

\_\_\_ \_\_\_ \_\_\_

Borrow ditch

\_\_\_ \_\_\_ \_\_\_

Other

Are these built or installed as designed?:

Turnouts

\_\_\_ \_\_\_ \_\_\_

Cattleguards

\_\_\_ \_\_\_ \_\_\_

Cattleguard drainage

\_\_\_ \_\_\_ \_\_\_

Fences and gates

\_\_\_ \_\_\_ \_\_\_

Signs

\_\_\_ \_\_\_ \_\_\_

Bridges

\_\_\_ \_\_\_ \_\_\_

Low water crossings

\_\_\_ \_\_\_ \_\_\_

Pipeline or utility crossings

\_\_\_ \_\_\_ \_\_\_

Have shoulder, fill and/or cut slopes been flattened to allow access to sheep wagon or other "two-track" trails?

\_\_\_ \_\_\_ \_\_\_

Permits

Does construction of the highway approach meet all state highway department permit requirements?

\_\_\_ \_\_\_ \_\_\_

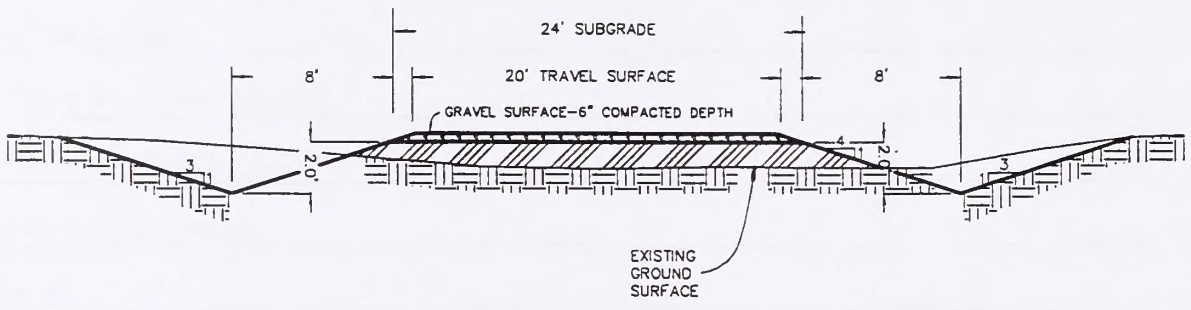
Does construction of the county road intersection meet all county and/or permit requirements?

\_\_\_ \_\_\_ \_\_\_

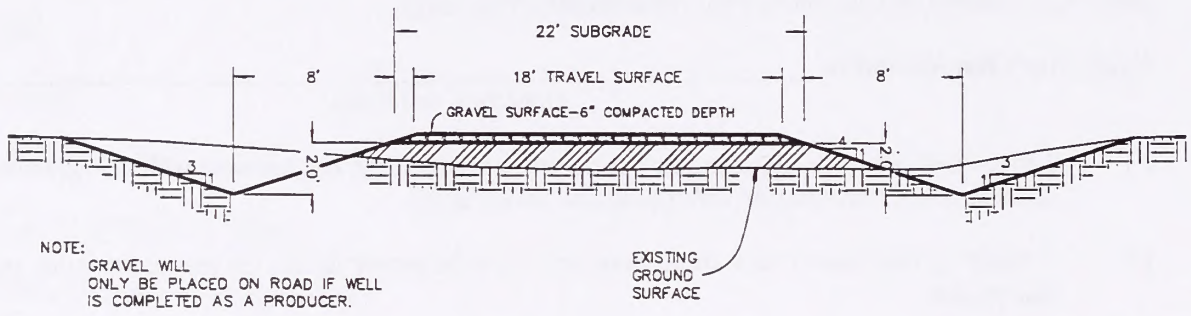








TYPICAL ROADWAY DETAIL  
LOCAL AND COLLECTOR ROADS

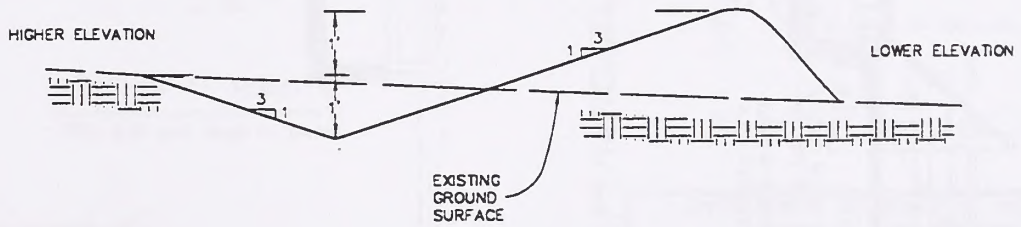
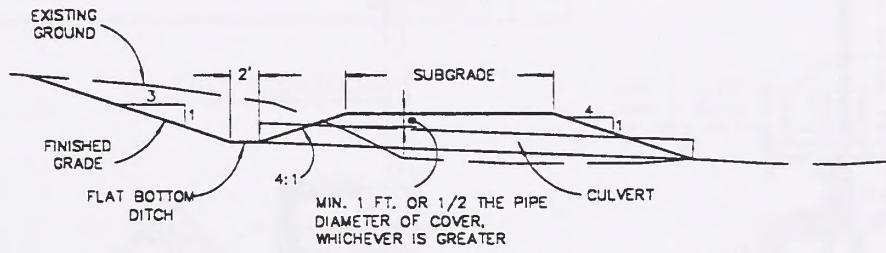
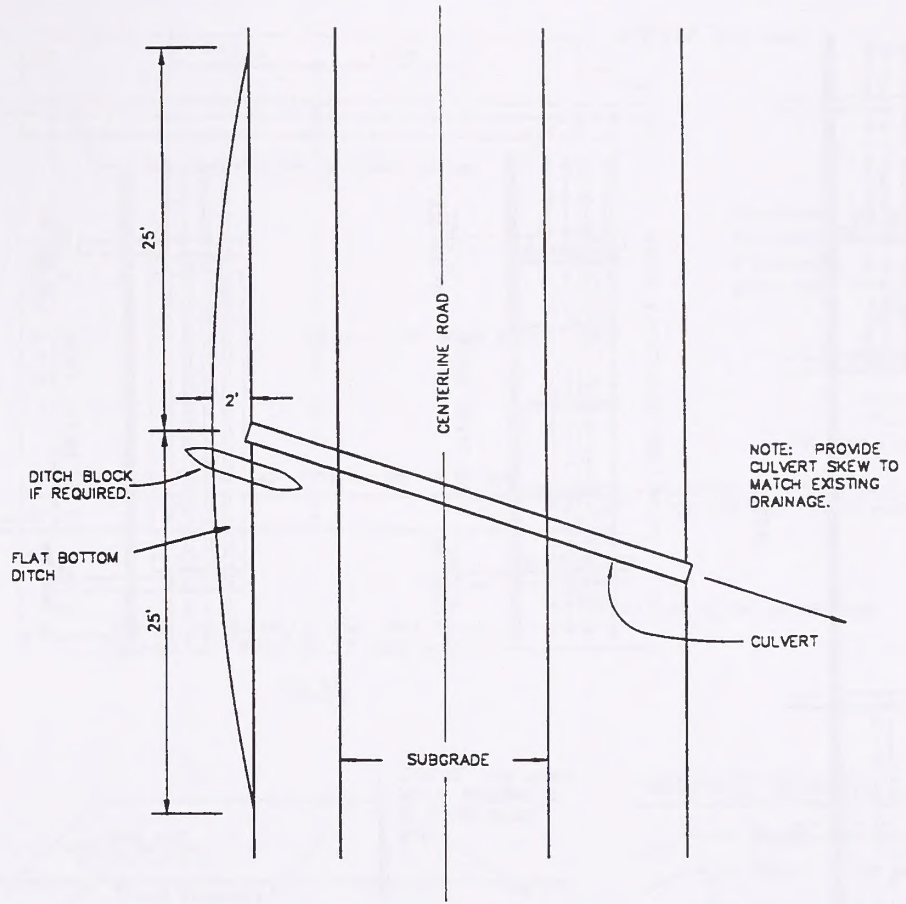


NOTE:  
 GRAVEL WILL  
 ONLY BE PLACED ON ROAD IF WELL  
 IS COMPLETED AS A PRODUCER.

TYPICAL ROADWAY DETAIL  
RESOURCE ROADS

TYPICAL ROADWAY DETAILS

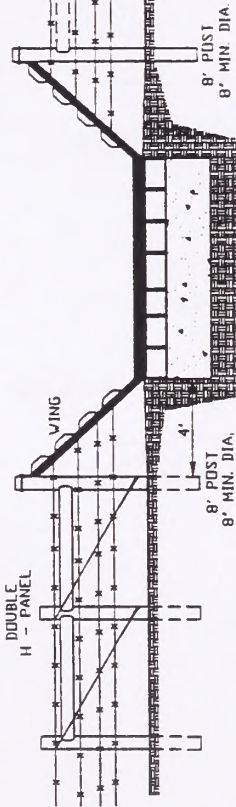




## TYPICAL DRAINAGE DETAILS



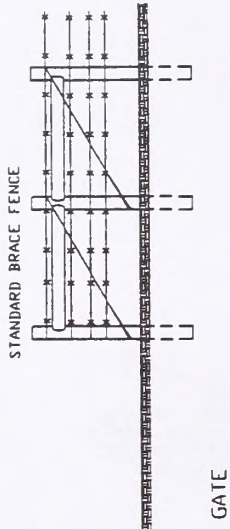
NOTE:  
ELEVATION OF CATTLEGUARD SET TO SAME GRADE AS ROAD.



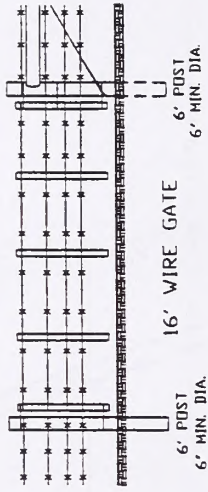
IF ROADSIDE DITCH EXISTS, DOUBLE H-PANEL SHALL BE LOCATED OUTSIDE OF DITCH AREA.

CATTLEGUARD

AN H-PANEL WILL BE USED WHEN DISTANCES EXCEED ONE ROD. A WOODEN BRACE BETWEEN CATTLEGUARD AND GATE POST WILL BE USED FOR DISTANCES LESS THAN ONE ROD.

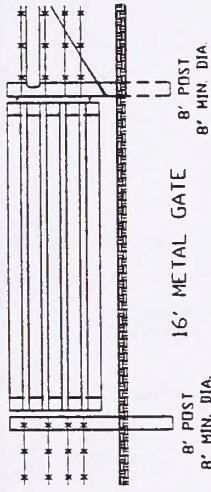
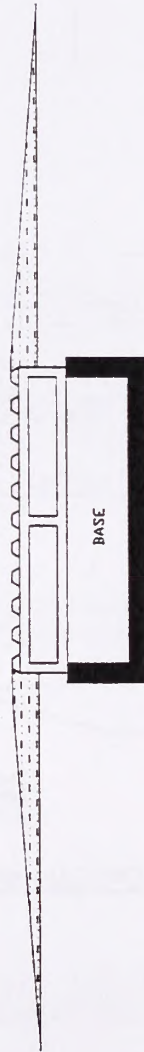


5 - 3" DIA. WOOD STAYS EVENLY SPACED.



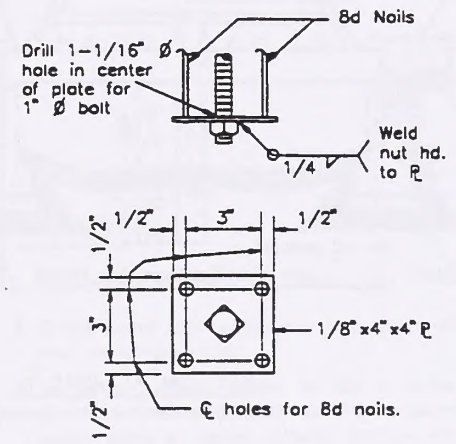
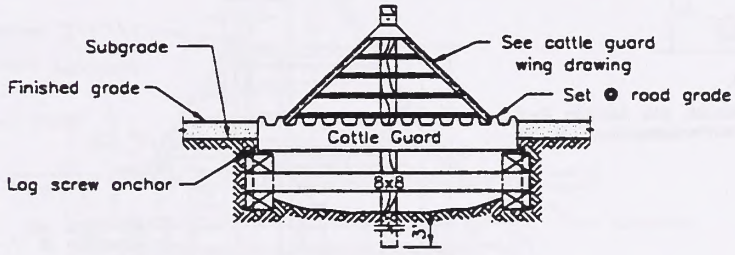
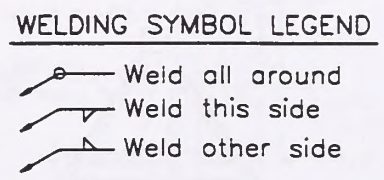
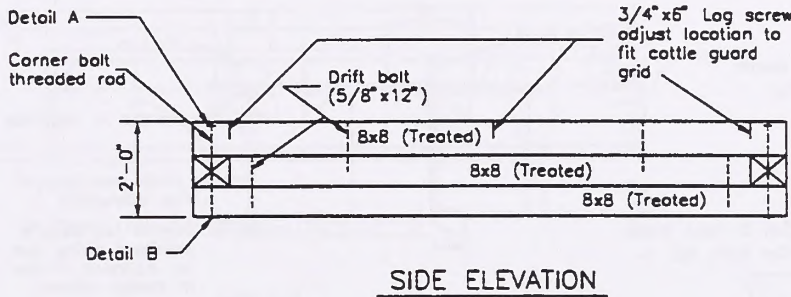
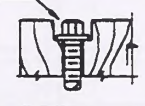
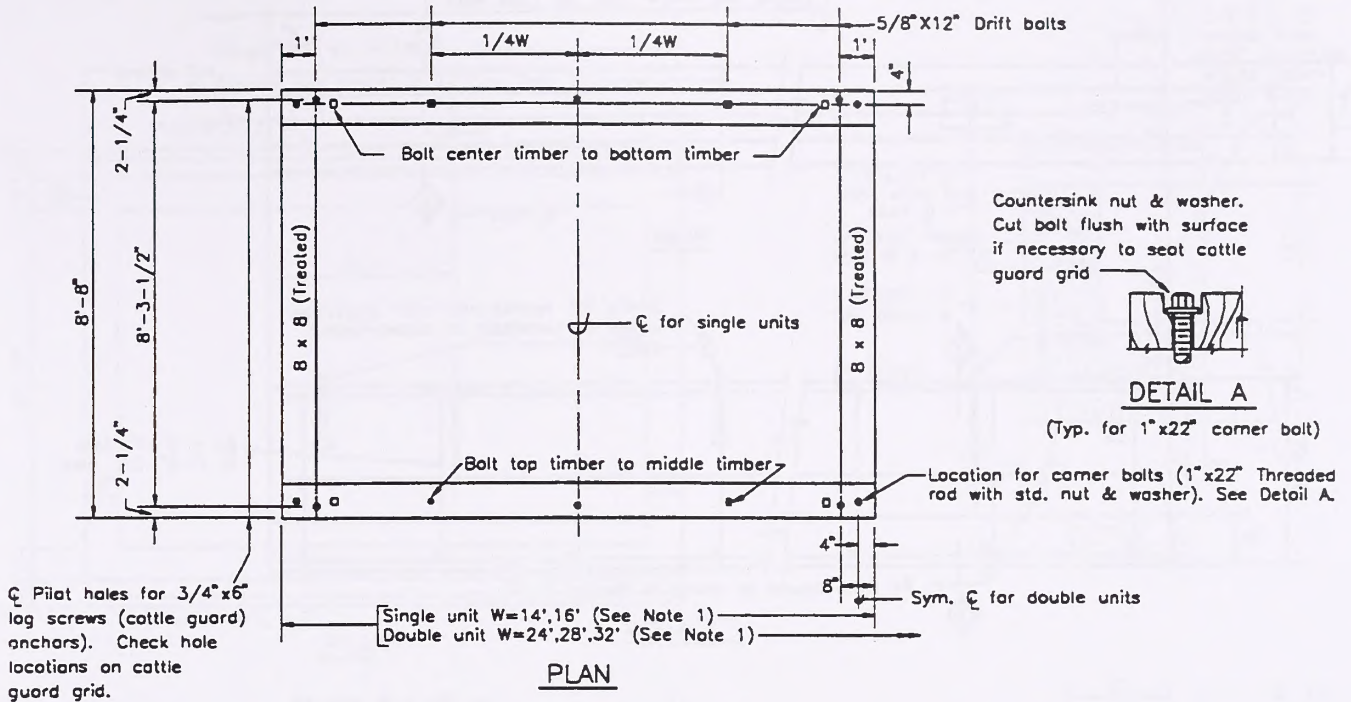
16' WIRE GATE  
6' POST  
6' MIN. DIA.

SIDE FRAME



16' METAL GATE  
8' POST  
8' MIN. DIA.



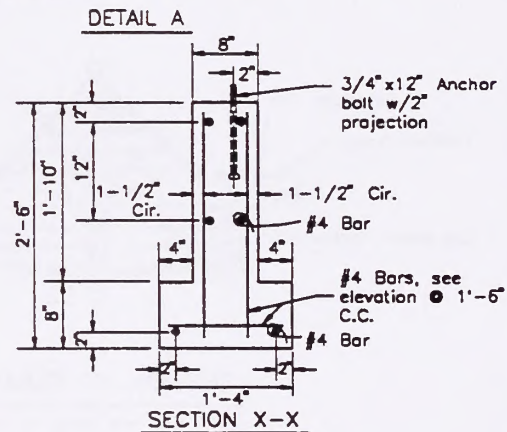
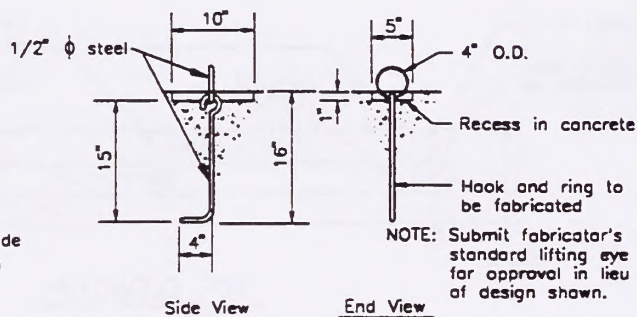
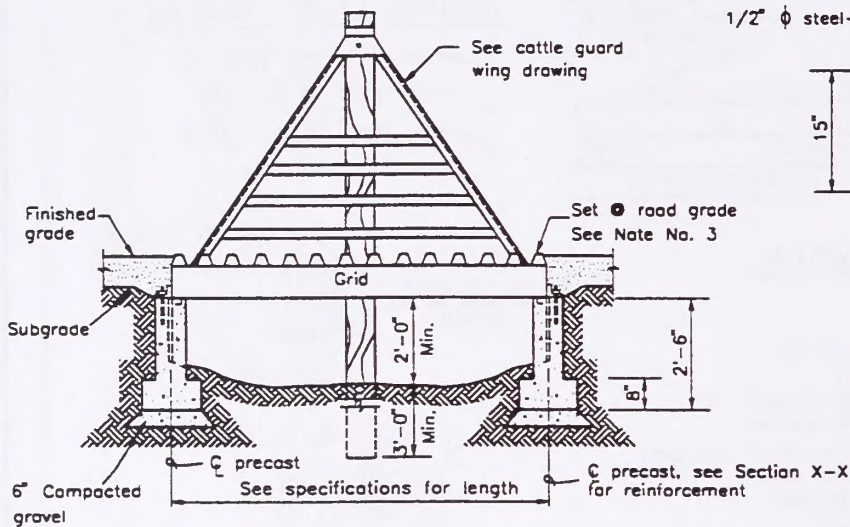
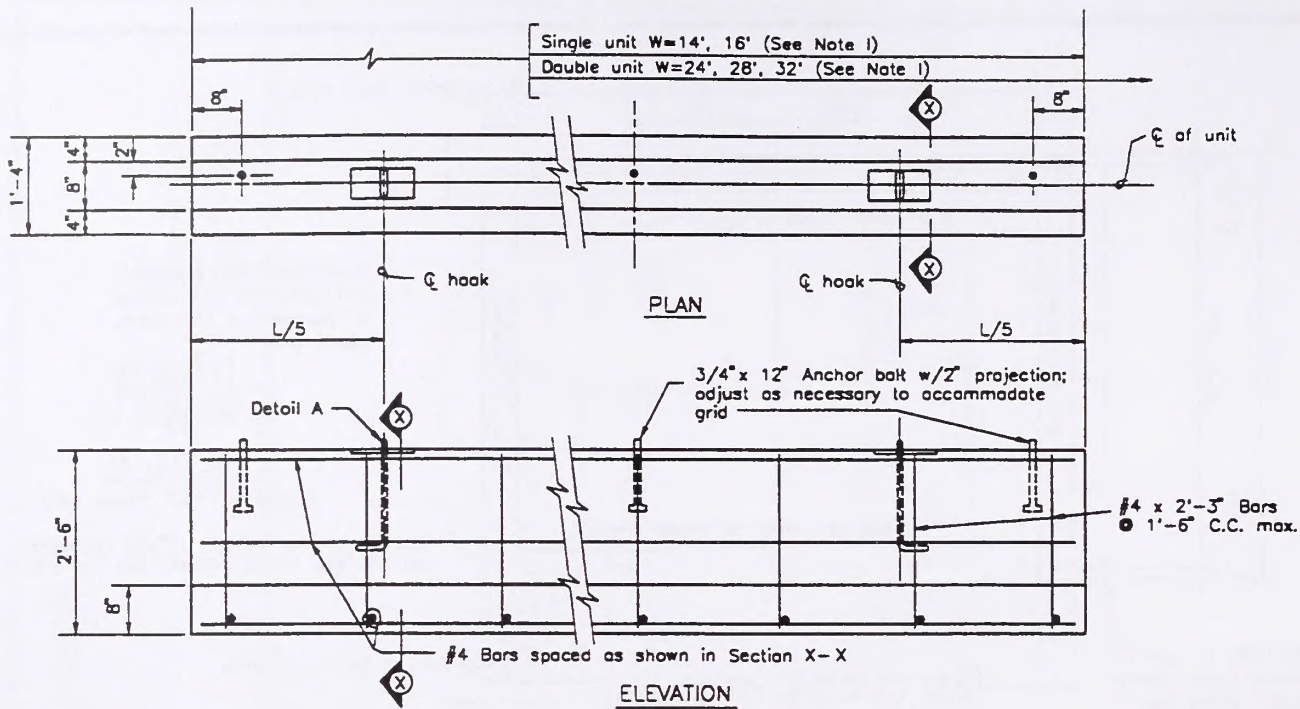


- NOTES:**
- See specifications for width (W).
  - Cattle guard anchor angles with 3/4" x 6" log screw with standard washer to be furnished with each single grid.
  - On earth-surfaced roads, set top of cattle guard eight inches above subgrade unless plans or stakes indicate another elevation. Taper fill back from cattle guard approx. 50 ft. in both directions.
  - Dimensions for lumber are nominal unless otherwise noted.

ALWAYS THINK SAFETY

|  |            |
|--|------------|
| UNITED STATES DEPARTMENT OF THE INTERIOR<br>BUREAU OF LAND MANAGEMENT<br>DIVISION OF TECHNICAL SERVICES SERVICE CENTER |            |
| <b>CATTLE GUARD FOUNDATION</b><br>(Timber)   |            |
| DESIGNED   | by others  |
| REVIEWED   | _____      |
| APPROVED   | _____      |
| DRAWN  | SCALE NONE |
| DATE AUGUST 27, 1990   | SHEET OF   |
| DRAWING NO. 02881-5  |            |





**NOTES:**

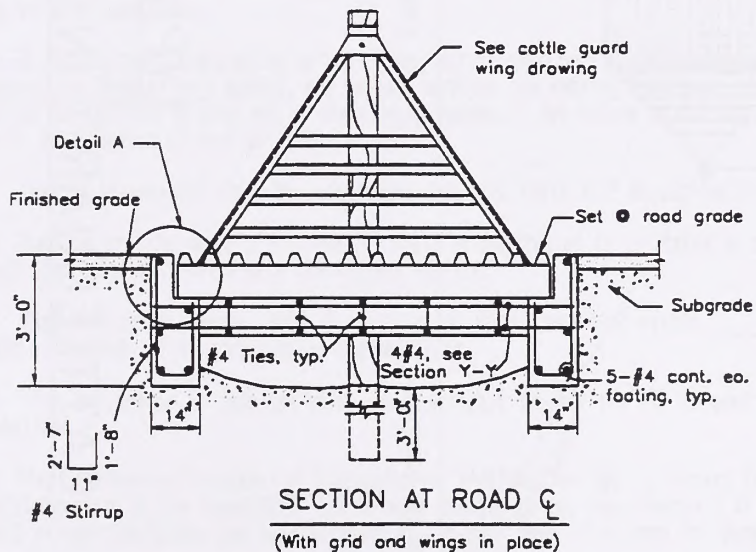
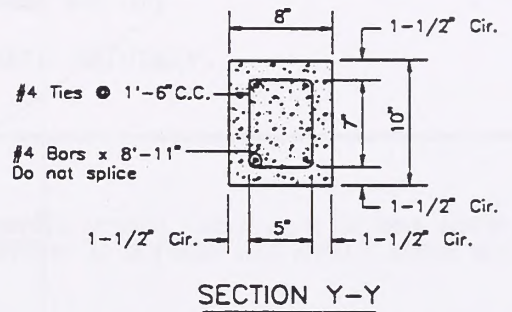
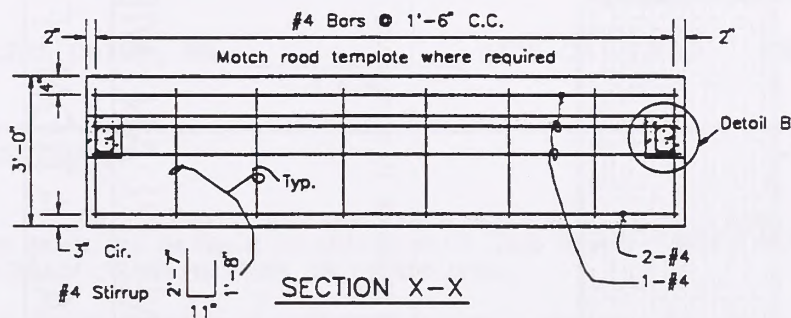
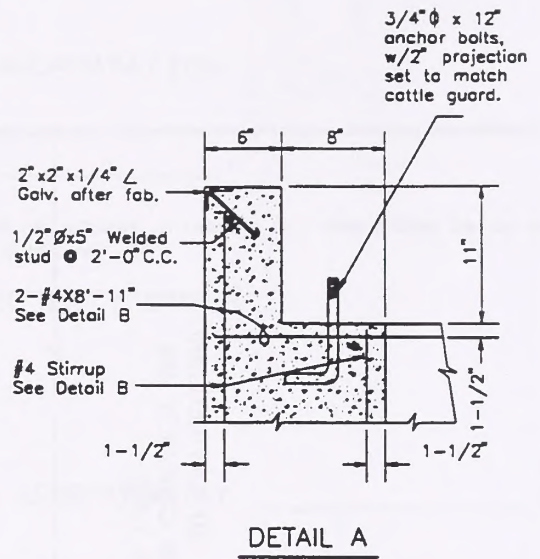
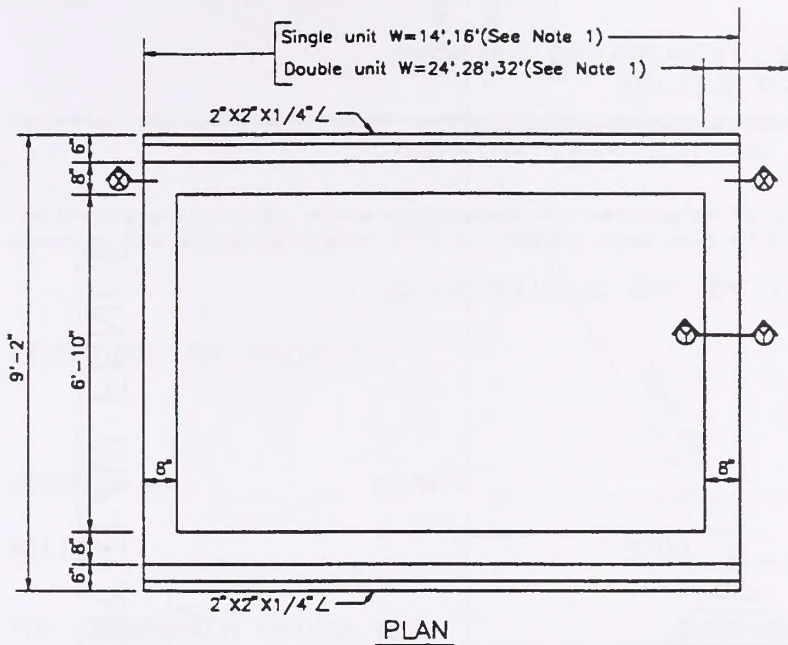
1. See specifications for width (W).
2. Standard nuts & washers shall be furnished with each foundation unit including anchor angles. Weld or bolt anchor angles to cattle guard.
3. On earth-surfaced roads, set top of cattle guard eight inches above subgrade unless plans or stakes indicate another elevation. Taper fill back from cattle guard approx. 50' in both directions.
4. #4 Reinforcement may be spliced with 24" lap unless prohibited.

| ESTIMATED QUANTITIES FOR FOUNDATION |            |          |          |                   |
|-------------------------------------|------------|----------|----------|-------------------|
| DESCRIPTION                         | QUANTITIES |          |          |                   |
|                                     | 14'        | 16'      | 24'      | 28' 32'           |
| UNIT WIDTHS                         | 14'        | 16'      | 24'      | 28' 32'           |
| CONCRETE                            | 2.2 C.Y.   | 2.5 C.Y. | 3.8 C.Y. | 4.4 C.Y. 5.0 C.Y. |
| #4 REINFORCING STEEL                | 276 L.F.   | 311 L.F. | 471 L.F. | 543 L.F. 624 L.F. |

ALWAYS THINK SAFETY

|  |            |
|--|------------|
| UNITED STATES DEPARTMENT OF THE INTERIOR<br>BUREAU OF LAND MANAGEMENT<br>DIVISION OF TECHNICAL SERVICES SERVICE CENTER |            |
| <b>CATTLE GUARD FOUNDATION</b><br>(Precast Concrete)   |            |
| DESIGNED   | by others  |
| REVIEWED   |            |
| APPROVED   |            |
| DRAWN  | SCALE NONE |
| DATE AUGUST 23, 1990   | SHEET OF   |
| DRAWING NO. 02881-7  |            |





**NOTES:**

1. See specifications for width (W).
2. Cattle guard grid dimensions shall be verified prior to construction.
3. On earth-surfaced roads, set top of cattle guard foundation eight inches above subgrade unless plans or stakes indicate another elevation. Taper fill back from cattle guard approx. 50 ft. in both directions.
4. #4 Reinforcement may be spliced with 24" lap unless prohibited.

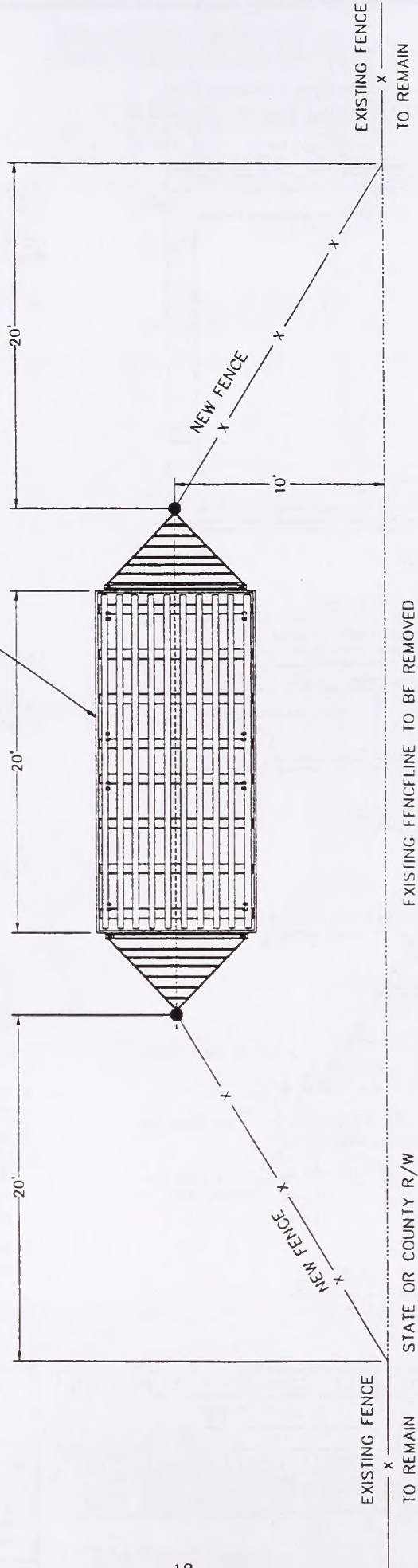
| ESTIMATED QUANTITIES FOR REINFORCED CONCRETE FOUNDATION |            |          |          |          |          |
|---|------------|----------|----------|----------|----------|
| DESCRIPTION   | QUANTITIES |          |          |          |          |
| UNIT WIDTHS   | 14'        | 16'      | 24'      | 28'      | 32'      |
| CONCRETE  | 3.3c.y.    | 3.7c.y.  | 5.4c.y.  | 6.3c.y.  | 7.1c.y.  |
| #4 REINFORCING STEEL                                    | 324 L.F.   | 355 L.F. | 486 L.F. | 547 L.F. | 618 L.F. |
| L 2"x2"x1/4"  | 28 L.F.    | 32 L.F.  | 48 L.F.  | 56 L.F.  | 64 L.F.  |

|  |            |
|--|------------|
| UNITED STATES DEPARTMENT OF THE INTERIOR<br>BUREAU OF LAND MANAGEMENT<br>DIVISION OF TECHNICAL SERVICES SERVICE CENTER |            |
| <b>CATTLE GUARD FOUNDATION</b><br>(Cast-In-Place Concrete)   |            |
| DESIGNED   | by others  |
| REVIEWED   |            |
| APPROVED   |            |
| DRAWN  | SCALE NONE |
| DATE AUGUST 24, 1990   | SHEET OF   |
| DRAWING NO. 02881-6  |            |

ALWAYS THINK SAFETY



20' H-20 CATTLEGUARD  
SET ON CONCRETE OR  
TIMBER BASE



TYPICAL PLAN VIEW  
CATTLEGUARD INSTALLATION FOR R/W FENCE

NOT TO SCALE



**WYOMING DEPARTMENT OF TRANSPORTATION  
ACCESS PERMIT**

DATE OF APPLICATION \_\_\_\_\_

The Undersigned hereby makes application for permission to construct an access driveway (s) described below and as shown on the attached sketch or plan "hereby made part of this application" to:

**TO BE FILLED OUT BY THE PROPERTY OWNER**

LOCATION OF PROPERTY:

HIGHWAY NO. \_\_\_\_\_ COUNTY \_\_\_\_\_ APPROXIMATELY \_\_\_\_\_

MILES \_\_\_\_\_ FROM \_\_\_\_\_  
N.S.E.W.

FOR INGRESS OR EGRESS TO A \_\_\_\_\_  
RESIDENCE OR BUSINESS AND TYPE

ACCESS DRIVE, ON \_\_\_\_\_ SIDE OF HIGHWAY, PROPOSED DRIVEWAY.  
N.S.E.W.

**AGREEMENT:**

I, the Undersigned property owner, request permission to construct an access driveway (s) on public right-of-way at the above location, subject to the restrictions and regulations contained in the "RULES AND REGULATIONS FOR ACCESS DRIVEWAY (S) TO WYOMING STATE HIGHWAYS" current edition. In consideration of these regulations, the applicant agrees:

- 1) To construct driveway(s) in a safe manner so as not to interfere with or endanger public travel and to perform all work in a neat and workmanlike manner, to use materials acceptable to the Department of Transportation and to leave the right-of-way clean and in a condition equal to or better than the original condition.
- 2) To fully protect the traffic on the highway during construction covered hereunder by proper barricades, flagman, and/or signs as shown in the Traffic Control for Roadway Work manual, and to hold harmless the Wyoming Department of Transportation, its officers and employees from all dangers, expenses, claims or liability arising out of any alleged damages of any nature to any person or property, due to the construction performance or nonperformance of work, or existence of said driveway.
- 3) That no driveway(s) shall be constructed such that there will be parking or servicing of vehicles within the highway right-of-way.
- 4) That the profile grade of driveway(s) shall be constructed as indicated on the attached sketch or plan and shall in no case be graded or maintained such that water will drain onto the highway surface.
- 5) That this permit becomes VOID if construction is not completed within \_\_\_\_\_ days after the initiation of construction or one year after the date of approval if no construction has been done.
- 6) That any change in land use which would generate greater traffic volumes would nullify this agreement for access and a new application must be submitted.
- 7) That the Wyoming Department of Transportation reserves the right to inspect these installations at the time of construction and at all times thereafter until accepted by the Department, and to make changes at any time necessary to provide protection of life and property on or adjacent to the highway. Once an approach/access has been accepted by the Department it becomes the Department's to maintain and repair except for snow or debris removal.
- 8) To any additional requirements as sent forth under DISTRICT ENGINEERING REQUIREMENTS/COMMENTS on reverse side, and/or any on the sketch or plans.

APPLICANT \_\_\_\_\_ ADDRESS \_\_\_\_\_  
(PRINT)

FIRM NAME \_\_\_\_\_ CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

PHONE NUMBER ( ) \_\_\_\_\_ SIGNATURE \_\_\_\_\_



DESCRIPTION FOR WYOMING DEPARTMENT OF TRANSPORTATION USE ONLY

ROAD SECTION \_\_\_\_\_, MILEPOST \_\_\_\_\_,
ROADWAY CLASSIFICATION \_\_\_\_\_, RIGHT OR LEFT STATION \_\_\_\_\_,
PROJECT \_\_\_\_\_, SECTION \_\_\_\_\_,
TOWNSHIP \_\_\_\_\_, RANGE \_\_\_\_\_,
WIDTH \_\_\_\_\_ FT, AND \_\_\_\_\_ RADIUS \_\_\_\_\_ FT, SURFACE TYPE \_\_\_\_\_,
DRAINAGE STRUCTURE REQUIRED YES/NO, LENGTH \_\_\_\_\_, TYPE/SIZE \_\_\_\_\_,
SLOPE \_\_\_\_\_ AND OR VALLEY GUTTER TO BE LOCATED \_\_\_\_\_ FEET FROM THE SHOULDER LINE.
RIGHT OF WAY FROM CENTERLINE OF HIGHWAY \_\_\_\_\_ FEET.

RIGHT-OF-WAY-DIVISION \_\_\_\_\_ PERMIT NO. \_\_\_\_\_
ACCESS CONTROL: FULL \_\_\_\_\_ LIMITED \_\_\_\_\_
NONE \_\_\_\_\_ NONE ASSUMED \_\_\_\_\_
SIGNATURE \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_

DISTRICT ENGINEERING:
PRELIMINARY FIELD INSPECTION BY \_\_\_\_\_ DATE \_\_\_\_\_
REQUIREMENTS/COMMENTS: (INCLUDE TITLE)

SIGNATURE \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_

APPROVAL FOR CONSTRUCTION:
THE ABOVE APPROACH PERMIT IS GRANTED, WITH THE CONDITIONS STATED HEREIN THE \_\_\_\_\_ DAY OF \_\_\_\_\_, A D 19 \_\_\_\_
WYOMING DEPARTMENT OF TRANSPORTATION BY: \_\_\_\_\_
DISTRICT ENGINEER/DISTRICT TRAFFIC ENGINEER

CONSTRUCTION INSPECTION:
I HAVE INSPECTED THE ACCESS DRIVEWAY(S) AND HAVE FOUND THE ACCESS(ES) TO BE CONSTRUCTED AS PER THE REQUIREMENTS ON THIS APPLICATION.
SIGNATURE \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_

ACCESS ACCEPTANCE:
DISTRICT PERSONNEL HAVE INSPECTED THE ACCESS DRIVEWAY(S) DESCRIBED ON THIS APPLICATION AND ATTACHED DRAWING(S) AND HAVE FOUND THE ACCESS DRIVEWAY(S) TO BE CONSTRUCTED IN THE MANNER AS PRESCRIBED ON THIS APPLICATION AND ATTACHED DRAWING(S).
\_\_\_\_\_ DISTRICT ENGINEER/DISTRICT TRAFFIC ENGINEER \_\_\_\_\_ DATE \_\_\_\_\_

REFERENCES: OPERATING POLICY 21-1/RULES & REGULATIONS FOR ACCESS DRIVEWAYS TO WYOMING STATE HIGHWAYS







# DRIVEWAY ACCESS PERMIT APPLICATION



(FOR OFFICE USE)

|                |       |
|----------------|-------|
| PERMIT NUMBER: | _____ |
| AFFLICANT:     | _____ |
| FIN:           | _____ |
| DATE RECEIVED: | _____ |
| DATE APPROVED: | _____ |
| DATE AMENDED:  | _____ |



1. AFFILICANT/BUILDER NAMES

|                                   |                                |
|-----------------------------------|--------------------------------|
| AFFILICANT:<br>ADDRESS:<br>PHONE: | BUILDER:<br>ADDRESS:<br>PHONE: |
|-----------------------------------|--------------------------------|

2. PERMIT INFORMATION. PLEASE ANSWER THE FOLLOWING QUESTIONS

A. Name of County Road on which driveway connects: \_\_\_\_\_

B. Location of driveway (Section, Township, and Range): \_\_\_\_\_

C. Driveway width: \_\_\_\_\_ Driveway radius: \_\_\_\_\_

D. List base material and depth of base: \_\_\_\_\_  
 (8" coarse gravel, min.)  
 List depth of gravel surface: \_\_\_\_\_  
 (4" crushed gravel, min.)

3. SITE PLAN AND CONSTRUCTION STANDARDS

A. Please complete and attach a site plan of the proposed driveway. Please follow the format illustrated in the attached drawing. Be sure your driveway conforms to the standards shown in the drawing and as outlined below:

B. Driveway Access Specifications:  
 (1) No driveway shall be constructed so that there will be parking or loading of vehicles on the County road.  
 (2) Where excessive cuts are made for the driveway in such a manner that erosion will be a problem, revegetation or retaining walls will be required.  
 (3) In no case shall a driveway be graded or maintained in such a way that water will drain onto the County road surface.  
 (4) 16-gauge corrugated metal pipe culvert of at least 18 inches in diameter shall be used on all driveways adjacent to County roads. The Road and Bridge Foreman may require larger culverts, alternative culvert material, and/or alternative driveway widths.  
 (5) Driveways shall not exceed an 8 percent grade.  
 (6) Portions of driveways built within the road easement or right-of-way shall be constructed of the same material as required for County roads.  
 (7) Design driveway to avoid safety hazards.



**4. PERMIT CONDITIONS**

The approval of this permit shall constitute the issuance of a Lincoln County Driveway Access Permit. Approval is based on the aforementioned information and site plan submitted, and is subject to Section 5.1 and 7.9 of the Permit System. Material omissions, fraudulent representation and/or false or inaccurate information used by an applicant to secure compliance with the Resolution shall be reason to deny or revoke any application or permit. This permit shall lapse and become null and void one year from the date of issuance unless a renewal application has been submitted and approved. The permit is subject to the conditions placed on the plan sheet.

**5. RIGHT OF INGRESS/APPLICANT CERTIFICATION**

I hereby grant authorized County personnel the right of ingress and egress from said lands for any and all inspection purposes necessary to the exercise of this permit. I certify, to the best of my knowledge, that the aforementioned information and material is true and correct.

**APPLICANT'S SIGNATURE:** \_\_\_\_\_

**DATE:** \_\_\_\_\_

**OWNER'S SIGNATURE:** \_\_\_\_\_  
 (The person who holds the recorded warranty deed.)

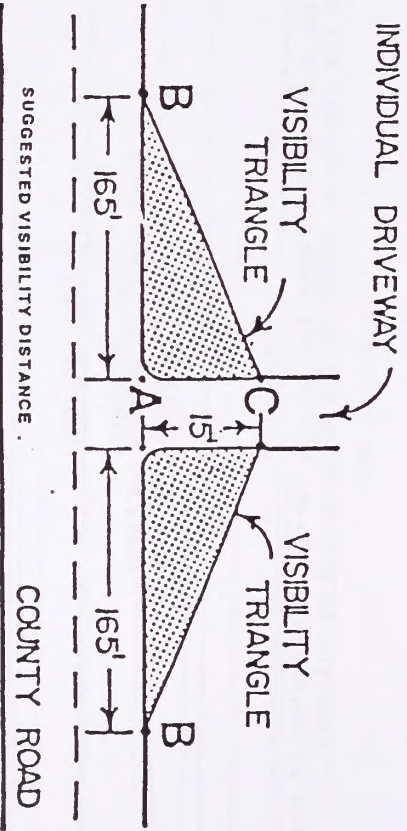
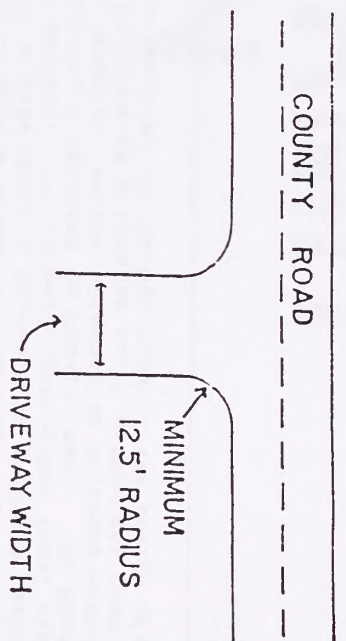
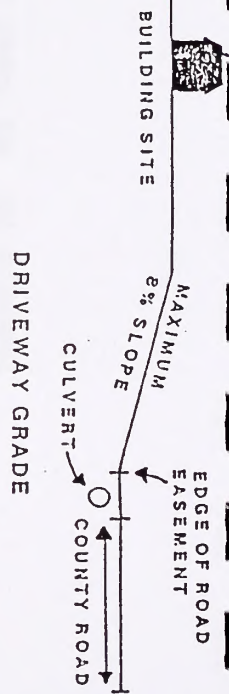
**DATE:** \_\_\_\_\_

**APPROVAL BY ADMINISTRATOR:** \_\_\_\_\_

**DATE:** \_\_\_\_\_

**INSPECTED BY:** \_\_\_\_\_

**DATE:** \_\_\_\_\_





|   |   |
|---|---|
| <p>PERMIT CONDITIONS/COMMENTS (This permit is approved subject to the following conditions:</p> <hr/> <hr/> <hr/> | <p><b>SITE PLAN</b></p> <p>Approved by: _____ Title: _____</p> <p>Date of Approval: _____</p> |
|---|---|



# COUNTY ACCESS PERMIT

County Project No. \_\_\_\_\_

Fee \$50.00

DATE OF APPLICATION \_\_\_\_\_

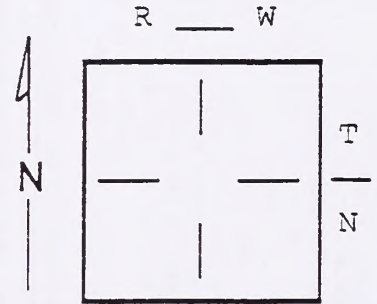
The undersigned hereby makes application for permission to conduct operations described below.

APPLICANT:

Name \_\_\_\_\_ Firm Name \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_  
State \_\_\_\_\_ Phone No. \_\_\_\_\_

GENERAL LOCATION OF OPERATIONS:

County Road (s) \_\_\_\_\_  
Located in Section (s) \_\_\_\_\_  
Approximately \_\_\_\_\_ from \_\_\_\_\_  
(miles) (city or well defined point)  
for the purpose of \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



AGREEMENT:

I, the undersigned, request permission to conduct the above described operations on Sweetwater County Right-of-Way at the above location, subject to County stipulations and instructions. In consideration of these regulations, the applicant agrees:

1. Proper means and precautions shall be taken to protect the public and private property, and proper signs shall be displayed.
2. The structure will be built according to plans and specifications dated \_\_\_\_\_ attached and made a part of this application.
3. Necessary precautions shall be taken to assure the safety and convenience of traffic during construction.
4. To obtain permission from all other interested parties and to indemnify Sweetwater County from all claims and damages from this work both now and in the future.
5. Any improper work method, unsafe condition for the public, and/or non-conformance with the above conditions will be sufficient reason to cause this work to be stopped until the problem is solved.
6. This permit shall not expire - shall expire in \_\_\_\_\_ days.
7. Additional requirements:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

SIGNATURE OF APPLICANT \_\_\_\_\_

FIELD INSPECTED AND CHECKED BY \_\_\_\_\_ AND RECOMMENDED FOR APPROVAL

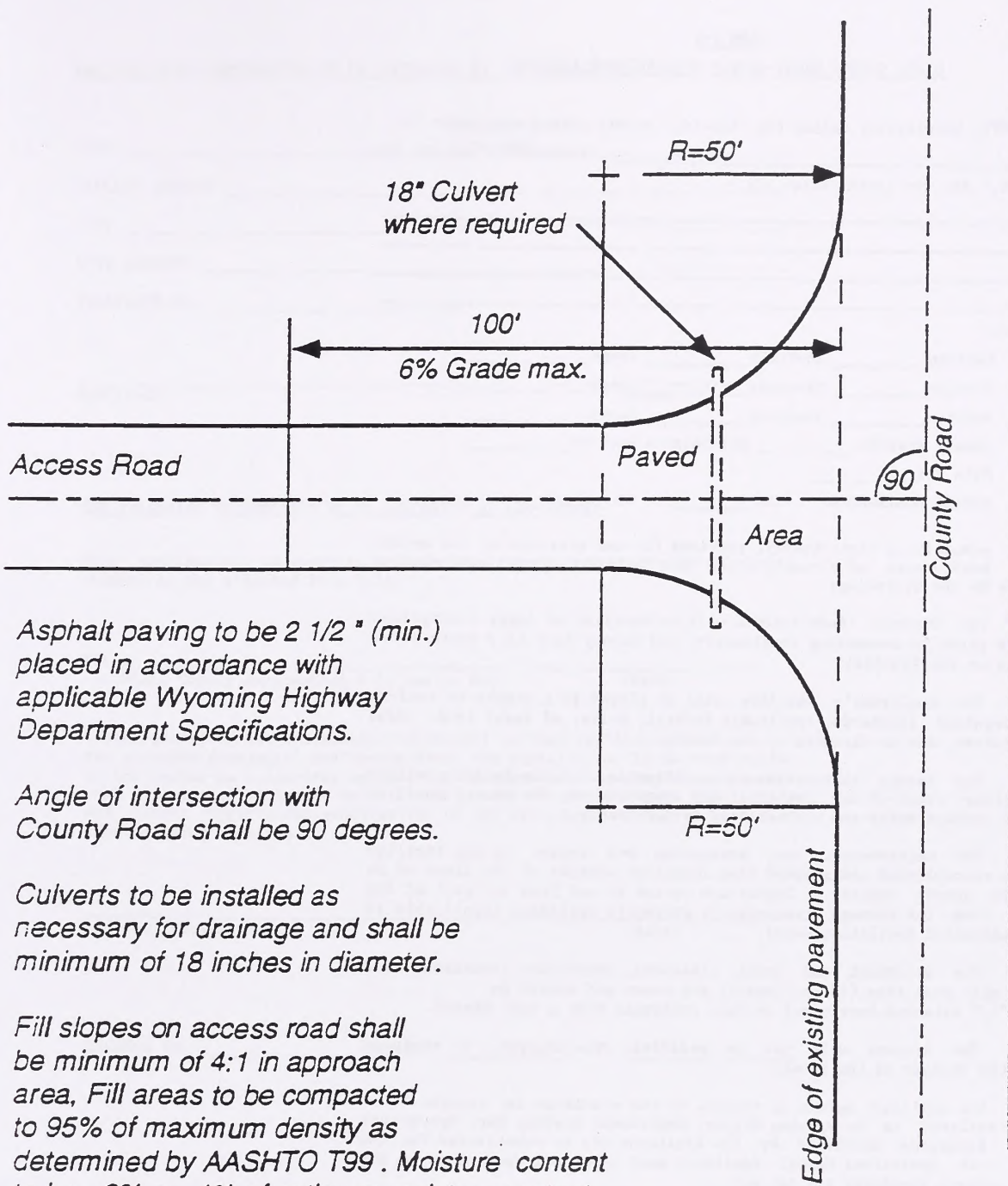
The above COUNTY PERMIT is approved with the conditions stated herein this \_\_\_\_\_ day of \_\_\_\_\_ A.D., 19\_\_.

\_\_\_\_\_  
County Engineer

Copy to Rd & Brdg \_\_\_\_\_  Copy to Rd file \_\_\_\_\_ FORM 103  Copy sent to company by \_\_\_\_\_ Revised 12/93

COMPLETE THIS SECTION BY APPLICANT





Asphalt paving to be 2 1/2" (min.) placed in accordance with applicable Wyoming Highway Department Specifications.

Angle of intersection with County Road shall be 90 degrees.

Culverts to be installed as necessary for drainage and shall be minimum of 18 inches in diameter.

Fill slopes on access road shall be minimum of 4:1 in approach area, Fill areas to be compacted to 95% of maximum density as determined by AASHTO T99. Moisture content to be +2% or -4% of optimum moisture content.

Crushed gravel base on approach area shall be minimum of 4" thick and compacted to 95% of maximum density as determined by AASHTO T99. Moisture content to be +2% or -4% of optimum moisture content.

For unpaved County roads gravel base is required.

DETAIL OF  
ACCESS ROAD APPROACH  
SWEETWATER COUNTY

1" = 30'

Rev 3/96



FORM R-1

UINTA COUNTY RIGHT-OF-WAY ENCROACHMENT LICENSE

UINTA COUNTY, hereinafter called the "County," hereby grants a license to \_\_\_\_\_, hereinafter called the "Applicant," for the installation of:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

located in:

Section \_\_\_\_\_ Township \_\_\_\_\_ Range \_\_\_\_\_

Section \_\_\_\_\_ Township \_\_\_\_\_ Range \_\_\_\_\_

Section \_\_\_\_\_ Township \_\_\_\_\_ Range \_\_\_\_\_

County Road No. \_\_\_\_\_ Maintenance Section \_\_\_\_\_

Mile Post \_\_\_\_\_

ACCESS CONTROLLED: YES \_\_\_\_\_ NO \_\_\_\_\_

Upon the property of Uinta County, acquired for and utilized in the operation and maintenance of a county road. The Applicant hereby acknowledges and agrees to the following:

- 1) The District Road Foreman will be notified at least twenty-four (24) hours prior to commencing construction and twenty-four (24) hours after completion on construction.
- 2) The Applicant's facility will be placed in a manner to conform with recognized standards, applicable federal, state, of local laws, codes and ordinances, and as directed by the County.
- 3) Any future alteration or modification of the facility within the existing right-of-way required and requested by the County shall be completed without delay and without cost to the County.
- 4) The maintenance, use, inspection and access to the facility shall be accomplished and secured from locations outside of the lines of no access or access control. Ingress and egress to and from any part of the facility from the through travelways is expressly forbidden (applicable to access controlled facilities only).
- 5) The alignment and grade, clearances, materials, pressures, land ties and mile post ties (if applicable) are shown and marked on Exhibit "A," attached hereto and by this reference made a part hereof.
- 6) The license will not be modified, transferred, or assigned without the consent of the County.
- 7) The Applicant agrees to conform to the standards for traffic control outlined in the Wyoming Highway Department Roadway Work Operations Manual. Standards developed by the Applicant may be substituted for the Roadway Work Operations Manual. Applicant must cease all operations if the traffic control standards are not met.
- 8) The applicant agrees to forever indemnify the County and save it harmless from all liability for damage to property or injury to or death of persons, including all costs and expenses related thereto arising wholly or in part or in connection with the existence of construction, alterations, repairs, renewals, uses or removals of the facility as they pertain to any county road.
- 9) This permit becomes VOID if construction is not completed within 365 days after the approval to construct date below.
- 10) Uinta County does not warrant title to the property covered by this license nor does this license grant an easement within the road right-of-way.



THE FOLLOWING INFORMATION TO BE COMPLETED BY THE APPLICANT

NAME \_\_\_\_\_ CONSTRUCTION  
FIRM NAME \_\_\_\_\_  
MAILING ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
SITE ADDRESS \_\_\_\_\_  
TELEPHONE NO. \_\_\_\_\_

\_\_\_\_\_  
Applicant (Date)

THE FOLLOWING INFORMATION TO BE COMPLETED BY THE COUNTY

This application is approved for construction subject to the stipulations checked on the attached Form R-1A.

BY: \_\_\_\_\_  
Uinta County Engineering & Surveying Rep. (Date)

I have inspected the installation described on this application and the attached drawing(s) and having found the installation to be constructed in the manner as proscribed on this application and the attached drawing(s) with any changes indicated on this application and the attached drawing(s), and hereby approve the construction of the previously mentioned installation as being complete.

\_\_\_\_\_  
District Road Foreman (Date)

LICENSE NO. \_\_\_\_\_ DATED: \_\_\_\_\_ BY: \_\_\_\_\_



# UINTA COUNTY ROAD ACCESS PERMIT APPLICATION

## APPLICANT:

Property Owner Name: \_\_\_\_\_ Mailing Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ Phone: \_\_\_\_\_

Authorized Agent Name & Address (if applicable): \_\_\_\_\_

## LOCATION OF PROPERTY:

County Road: \_\_\_\_\_ Rural Address: \_\_\_\_\_

Located in Section \_\_\_\_\_ Township \_\_\_\_\_ North, Range \_\_\_\_\_ West OR

Subdivision: \_\_\_\_\_ Lot \_\_\_\_\_ Block \_\_\_\_\_

## ACCESS:

Access to be used for ingress and egress to a \_\_\_\_\_  
(subdivision, residence, business, etc.)

Access surface: \_\_\_\_\_ Access width (see item 3 below): \_\_\_\_\_  
(gravel, asphalt, etc.)

Drainage structure (if required): size (dia): \_\_\_\_\_ length: \_\_\_\_\_ type: \_\_\_\_\_

**NOTE:** Show access location on reverse side of this sheet.

## AGREEMENT

I, the undersigned property owner or authorized agent, request authorization to construct an access onto a county right-of-way at the location described above and shown on the reverse side of this application, subject to the restrictions contained in the "Uinta County Road Access Encroachment Resolution". In consideration of these regulations, the applicant agrees to the following:

1. Construct and maintain access in a safe manner so as not to interfere with or endanger public travel and to perform all work in a neat and workmanlike manner, using materials per County Road Standards and that the right-of-way will be cleaned and left in a condition equal to or better than the original condition. The applicant will fully protect traffic on the County Road during construction covered hereunder by proper barricades, flagmen and/or lights, and to hold harmless Uinta County, its officers and employees from all damages, expenses, claims or liability arising out of any alleged damages of any nature to any person or property, due to the construction, performance or non-performance of work, or existence of said access.
2. No access shall be constructed such that there will be parking or servicing of vehicles on the county road right-of-way.
3. The maximum width of the proposed access shall be 20 feet for agricultural or residential and 30 feet for commercial, industrial or a subdivision roadway.
4. This permit becomes VOID if construction is not completed within 365 days from the approval date below.
5. The County Road Foreman shall be notified 24 hours prior to construction and within 30 days after construction is completed (783-1055 Evanson; 782-3254 Bridger Valley).
6. Additional requirements: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I, being the Applicant or representative thereof, have read this application and fully know the contents and statements contained herein to be true and correct to the best of my knowledge.  
Applicant or Representative: \_\_\_\_\_ Date: \_\_\_\_\_

## THIS SECTION FOR COUNTY USE ONLY

### UINTA COUNTY SURVEYING/PLANNING:

This application is approved for construction subject to the stipulations as indicated above.

Uinta County: \_\_\_\_\_ Date: \_\_\_\_\_

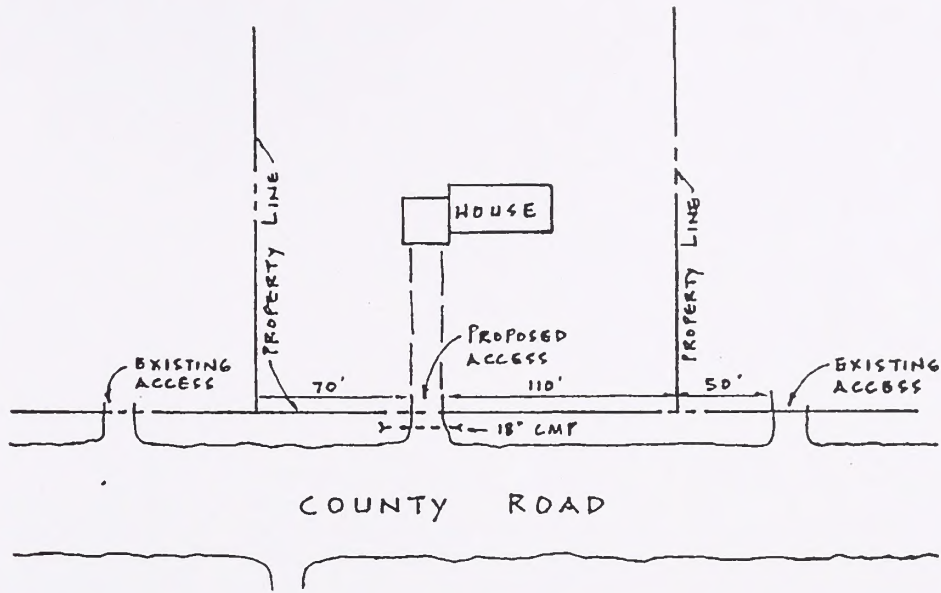
### FINAL INSPECTION AND APPROVAL:

I have inspected the access as described on this application and have found it to be constructed in the manner prescribed on this application and attached drawings; said access is hereby approved as constructed.

County Road Foreman: \_\_\_\_\_ Date: \_\_\_\_\_

PERMIT NO. \_\_\_\_\_





## EXAMPLE PLOT PLAN

---

DRAW YOUR PLOT PLAN BELOW











