1996

Record of Decision for Fontenelle Natural Gas Infill Drilling Projects Environmental Impact Statement, Sweetwater and Lincoln Counties, Wyoming

United States Department of the Interior Bureau of Land Management

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Record of Decision for Fontenelle Natural Gas Infill Drilling Projects Environmental Impact Statement Sweetwater and Lincoln 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.
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RECORD OF DECISION

For
Fontenelle Natural Gas Infill Drilling Projects

Environmental Impact Statement

This document records the decision made by the Bureau of Land Management (BLM), in cooperation with the Bureau of Reclamation (Reclamation), for managing the public land surface and federal mineral estate in the DALEN® Fontenelle II Unit and in the Lincoln Road project areas of the Fontenelle Natural Gas Infill Drilling Projects (hereafter referred to as the Fontenelle Projects). The DALEN project area comprises approximately 25,323 acres (21,579 acres BLM, 520 acres Reclamation, 1,290 acres State, and 1,934 acres private). The Lincoln Road project area comprises approximately 154,425 acres (103,306 acres BLM and 50,359 acres Reclamation, 339 acres State, and 227 acres private). See Figures 1-1, 1-2, and 1-3 for location of the Fontenelle Projects.

[Note: * DALEN Resources Oil & Gas Company was acquired by Enscore Exploration Inc. in December 1995. Enscore Exploration Inc. was recently acquired by Cross Timbers Operating Company. For purposes of this document the Fontenelle II Operator will continue to be referred to as DALEN. ** Cabot Oil & Gas Corporation, Pennzoil Oil Company, Texas USA, and several other companies collectively make up the Lincoln Road Operators.)

DECISION

The Bureau of Land Management (BLM) approves the Fontenelle Projects Resource Protection Alternatives (RPAs) for natural gas development and production. Approval of the RPAs provides for managing the area, in accordance with the Federal Land Policy and Management Act (Sec. 202(e)), in a manner that allows for natural gas development while continuing to provide for the existing principal and major uses (i.e., domestic livestock grazing, fish and wildlife development and utilization, mineral exploration and production, rights-of-way, and outdoor recreation) recognized by the land use plan for this area. The RPAs balance the multiple uses and sustains the long-term yield of resources, while promoting stability of local and regional economies, environmental integrity and conservation of resources for future generations.

The RPAs recognize the area of the Fontenelle Projects as one which has been under development for natural gas since 1948 and will continue to be developed for its natural gas resource. The RPAs also recognize that other important natural resources and values within the area require consideration and protection from unnecessary or undue degradation. In planning the implementation, operation, and abandonment activities for mineral resource development, the RPAs give maximum consideration to the protection of wildlife habitats, livestock grazing, recreation, travel, watersheds, water quality, and other land and resource uses in the Fontenelle Projects area.

The BLM approval of the RPAs, and the individual actions associated with them, are subject to the administrative requirements and conditions of approval listed below as well as the applicant-committed practices and environmental standards, procedures, and requirements specified in Appendices A through G of this Record of Decision (ROD). This ROD authorizes the BLM, Green River Resource Area Manager to process Applications for Permit to Drill (APDs), Sundry Notices (SNs), Rights-of-Way (ROWs), and Temporary Use Permits (TUPs) on public lands administered by the BLM and on Reclamation lands (in accordance the Interagency Agreement between BLM and Reclamation) for the Fontenelle Projects Operators and for companies contracted by the Fontenelle Operators. Approval of individual applications authorize the implementation of the various components of the Fontenelle Projects (e.g., access road and well pad construction, gas gathering pipeline and production facilities installation, etc.). The BLM will coordinate the issuance of permits to drill and ROWs on lands under the administration of Reclamation.

Because the Frontier/Dakota Formations associated with the Fontenelle Projects have low porosity and permeability, and to attain maximum ultimate economic recovery of the natural gas resource with minimum waste (43 CFR 3162(a)), infill drilling at a well spacing of 160 and 80 acres will be necessary.

PROJECT COMPONENTS

This ROD provides approval to permit the following project components on public lands within the DALEN and Lincoln Road project areas (see Figures 1-2 and 1-3):
Figure 1-1
General Location of the Fontenelle Natural Gas Infill Drilling Projects Cumulative Impact Study Area
Figure 1-2
Location of the DALEN Project Area and Cumulative Impact Study Area

Figure 1-3
Location of the Lincoln Road Project Area and Cumulative Impact Study Area
Drilling, completing, testing, and producing up to 1,292 natural gas wells on BLM- and Reclamation-administered lands. This means the approval of up to 197 wells within the DALEN project area (192 wells on BLM-administered lands and 5 wells on Reclamation-administered lands) and up to 1,095 wells within the Lincoln Road project area (780 wells on BLM-administered lands and 315 wells on Reclamation-administered lands). The DALEN and Lincoln Road Operator’s will drill wells on 160- and 80-acre spacing as approved, over the next ten years.

Construction and installation of tanks, separators, dehydration units, and other equipment at individual well sites needed to produce these wells for the life of the well.

Construction and operation of up to 303 miles of access road.

Construction and operation of up to 420 miles of 3- to 4-inch diameter natural gas gathering pipeline routed in a manner that best utilizes the existing topography in order to minimize surface disturbance including surface and buried pipelines, and pipeline placement parallel to existing roads.

The RPAs avoidance and impact minimization measures shall be implemented. These measures require moving well locations, eliminating well locations, directionally or horizontally drilling some selected wells, and seasonally constraining activity. Appendix D of this Record of Decision provides a list of the changes to the DALEN and the Lincoln Road Operator’s proposals to avoid known resource conflicts.

ADMIRISTRATIVE REQUIREMENTS AND CONDITIONS OF APPROVAL

Implementation of the Fontenelle Projects is subject to the following:

Authorizing Actions. The DALEN and Lincoln Road Operators are responsible for obtaining all necessary federal, state, and country permits, and for developing the Fontenelle Natural Gas Infill Drilling Projects area in an environmentally responsible manner (see Appendix A, Table 1-1, Federal, State, and Local Permits, Approvals and Authorizing Actions Needed for Construction, Operation, Maintenance and Abandonment of Resource Protection Alternatives).

Site Specific Environmental Analysis. Before authorization of individual actions on public lands (e.g., APD, Sundry Notice, ROW, TUP), the final location for each well site, access road, gathering pipeline segment, or other facility will be determined following a site specific environmental assessment in accordance with the BLM National Environmental Policy Act Handbook (H-170-1). Documentation will be on BLM Form WY-1792-08 (Appendix B).

Plans/Reports. Authorization of individual or multiple actions (e.g., road construction, well pad construction and drilling, pipeline construction, production facility installation), will require the Responsible Operator to submit the following plans/reports on their field operation, or with individual applications (e.g., APD, SN, ROW, TUP), to the BLM Green River Resource Area Manager. BLM will provide a copy of the same information submitted to the BLM to the Bureau of Reclamation Provo Area Office Manager as requested. These plans/reports will be consistent with the Operator's field operations guide, a copy of which will be kept on-site and in the office of the Operator:

Transportation Plan; Spill Prevention Control and Countermeasures Plan (SPCC Plan); Reclamation and Monitoring Plan; Cultural Cleanup Reports (Class I and II); Storm Water Pollution Prevention Plan/Erosion Control Revetment Restoration Plan; and applicable mitigation and monitoring measures from Appendix A of this Record of Decision (for explanation of individual Plans/Reports).

Road Development Plan-Transportation plan. A Road Development Plan/Transportation Plan has been approved for the DALEN project area. A Road Development Plan for the Lincoln Road Area has been prepared by the engineering consulting firm of D.F. Griffin and Associates, Inc. for the Lincoln Road Operators (Appendix C). The Plan describes the procedures by which transportation planning, road design, construction and road maintenance will be conducted by the Lincoln Road Operators to meet their operational needs and BLM requirements for roadway standards, safety, and resource protection. Further guidance on this content and processes for Transportation Planning are being developed in consultation with the Green River Basin Advisory Committee.

Transportation planning for the Lincoln Road project area will incorporate the annual review of well development plans between the operator and BLM. The review will entail assessment of existing roads and how the planned incremental well development roads tie in with the existing network to ensure safety and protection of natural resource values. As individual APDs, SNs, ROWs, and/or TUPs are prepared for submission to BLM following on-site inspection, site-specific considerations relative to safety and environmental protection will be given to access road location, design, construction, and maintenance in accordance with the guidance of the Road Development Plan for the Lincoln Road Area.

Road Maintenance Agreement. DALEN and Lincoln Road Operators will utilize an extensive network of existing and new roads in the Fontenelle Natural Gas Infill Development Area. Most of the Collector Roads and some of the Local Roads are shared by the field Operators. To ensure that appropriate maintenance of these roads occurs, a road maintenance agreement, which will provide for the shared cost of road maintenance, will be drawn up and signed by all operators. The appropriate share of each operator in covering the cost of the maintenance will be determined on the basis of the number of wells each has within the BLM area or other area agreed upon basis. The largest operator within the Lincoln Road project area shall administer the road maintenance agreement jointly with the BLM. If a road maintenance agreement is not consummated between the Fontenelle Projects Operators within a reasonable period of time (e.g., one year of the date of this ROD) then the BLM will contract necessary access road maintenance and bill the operators accordingly.

Air Quality. All future air pollutant emissions from federally authorized development within southwest Wyoming, including the Fontenelle, Moxa Arch, Stagecoach Draw and Jonah development, shall demonstrate compliance with all applicable local, state and Federal air quality laws, statutes, regulations, and implementation plans.

Emissions

Air pollutant emissions from operation of the Fontenelle development projects, based upon the analysis assumptions used in the Moxa Arch and Fontenelle EIS: Air Quality Technical Support Document (Cumulative Impact Analysis of Southwestern Wyoming Natural Gas Development Projects on Air Quality), shall be limited per well site and compressor site as follows:

Well Site Emissions

TSP: 1 tons per year
PM: <1 tons per year
VOC: 0.06 tons per year
CO: 0.08 tons per year
NOx: 0.40 tons per year
SO2: <1 tons per year
HAP: 0.04 tons per year

Compressor Site Emissions

TSP: <1 tons per year
PM: <1 tons per year
VOC: 0.22 tons per year
CO: 0.70 tons per year
NOx: 0.40 tons per year
SO2: <1 tons per year
HAP: 0.44 tons per year

1 Assumes well is equipped with mechanical pumps, glycol pump, 2 condenser storage tanks, a three-phase separator and heater, and a dehydrator.

Visibility Emissions Cap

Total oxides of nitrogen (NOx) emissions from future permit authorizations (including rights-of-way, surface notices, and applications for permit to drill) shall be limited (capped) to 977 tons per year above levels existing as of May 1996. The area of application is limited to the BLM Rock Springs District (including the Moxa Arch, Fontenelle, Stagecoach Draw and Jonah development projects). The cap will remain in effect until the Interagency Committees on Air Quality, or other information source, provide recommendations, with supporting technical analysis regarding regional visibility impacts, demonstrating the emissions cap should be changed. This emission cap is binding only on future federal actions authorized on federal lands.

If total NOx emissions from future permit authorizations reach 782 tons per year (80% of cap), additional cumulative air quality environmental review will be conducted by the Federal Land Management Agency in cooperation with Wyoming Department of Environmental Quality (DEQ), EPA Region VIII, USDA-Forest Service and other affected agencies, to verify that all of current emissions, determine modeled visibility impacts, determine whether unanticipated visibility impacts are occurring, etc.

The 782 tons per year total NOx emissions threshold is not a cap for authorized development on Federal lands in the Rock Springs District. Rather, it is the point at which re-evaluation shall occur to provide timely management review before the total NOx emissions cap of 977 tons per year is reached.

If the 977 tons per year total NOx emissions cap is reached before the Interagency Committees on Air Quality or other information source provide recommendations that the cap should be changed based on supporting technical
analysis regarding regional visibility impacts, the
proponent (applicant) shall submit a request for exception
two months in advance, which includes an additional to the
the total NO, emissions threshold and cap if nonferrous mitigation
measures to reduce, eliminate, or offset existing NO,
emissions, and demonstrates the proposal would not
cause significant deterioration in visibility greater than 0.5
decile in any PSD Class I area. This "exception request" will
be reviewed by the BLM in cooperation with Wyoming DEQ, EPA Region VIII, USDA-Forest Service and other
affected agencies. A recommendation will then be made to
the BLM State Director for a separate "Record of
Decision."

Atmospheric deposition
No additional air quality mitigation shall be required to
further reduce nonferrous atmospheric deposition in high
mountain lakes with low acid neutralizing capacity
(ANC). The Wyoming DEQ has agreed to encourage
offsetting or reducing NO, emissions from proposed or
existing activities when permitting new emission sources or
processing permit renewals under Wyoming Air Quality
Standards and Regulations within southwest
Wyoming, including the Moab Arch, Fontenelle, Stagecoach Draw and Jonah development areas.

Mitigation
No additional air quality mitigation shall be required to
further reduce potential air quality impacts. The
Wyoming DEQ currently requires Best Available Control
Technology (BACT) be applied for all air quality permits.
Wyoming DEQ and BLM will work with site-specific BACT
analysis be conducted by the proponents as part of the pre-
construction permit application. This long standing
requirement is a technology forcing regulation which will
help mitigate potential NO, emissions impacts.

Monitoring
At this time, no additional air quality monitoring measures
shall be required to measure and track potential air quality
impacts which is provided for in the lease terms. The
BLM will continue to cooperate with existing visibility
and atmospheric deposition impact monitoring programs.
The need for and the design of additional monitoring will
be considered at the recommendation of the Office on
Air Quality. Based upon the Committees
recommendations, operators may be required to
cooperate in the development of a coordinated air quality
monitoring program.

The BLM shall be responsible for implementing the total
NO, emissions threshold and cap as nonferrous mitigation
measures to reduce, eliminate, or offset existing NO,
emissions, and demonstrates the proposal would not
cause significant deterioration in visibility greater than 0.5
decile in any PSD Class I area. This "exception request" will
be reviewed by the BLM in cooperation with Wyoming DEQ, EPA Region VIII, USDA-Forest Service and other
affected agencies. A recommendation will then be made to
the BLM State Director for a separate "Record of
Decision."

Endangered Fish - The FWS Colorado River Endangered Fish Recovery Program, where depletion of water in exceed 100 acre-feet less than the Colorado River in any one year.

BWM will conduct monitoring inspections of construction and rehabilitation operations through Inspection and Enforcement and Environmental Compliance personnel and/or periodic interdisciplinary team field reviews to ensure the mitigation measures are effective and implemented.

Big Game Cruel Winter Range Disturbance.
The level for new long-term acres of disturbance associated
with well pads and access roads (assumes 100 percent reclamation of pipeline disturbance) within each of the project areas is set at 285 acres for the DALEN project area and 1,600 acres for the Lincoln Road project area. This assumes an average long-term disturbance of 0.7 acres per well pad and 3.4 acres per road. (i.e., 28-foot average unrestrained roadway width).

Sensitive Resource Value Protection. As stated
above, the RPA avoidance and minimization measures that resulted in moving well locations, eliminating well locations, or requiring mitigation for the impacts of disturbance, and wells, and seasonally constraining activity shall be implemented. Appendix D of this Record of Decision provides a list of changes to the DALEN and the Lincoln Road Operator's proposals to avoid resource conflicts.

In addition, development within the sensitive surface resource value areas (Figure 2-5 shaded area), identified to emphasize protection for critical winter range, sage grouse leks, historic trail buffers, Visual Resource Management (VRM) Class II areas, and the Blue Forest area, will be subject to further consideration for moving well locations or drilling multiple wells (e.g., directional, horizontal, conventional) from an existing pad on a case-by-case basis. Within critical winter range, once four
pads exist within a section, consideration for drilling multiple wells from an existing pad will be evaluated. Within VRM Class II areas the pad limit will be whatever is necessary to maintain the visual integrity of the buffer along the Green River and Fontenelle Reservoir. Well pads, access roads, facilities, and production facilities will remain subordinate to the characteristic landscape.

A request for an exception to consideration for drilling multiple wells from a pad will require the Operator to provide the following information with their notice of making (NOM) or preliminary ACP submission for wells
located within the sensitive area. Upon receipt of the
information, a reservoir and economic analysis will be conducted by the BLM Wyoming Reservoir Management
Group to determine the technical and economic feasibility of a directionally or horizontally drilled well. The Reservoir Management Group will submit a report on their analysis to the BLM Area Manager for decision.
A. Well Reserve/Economics:
- Expected recoverable reserves,
- Well costs,
- Gas price,
- Payout, etc.

B. Resource Protection:
- Within crucial winter range areas within the sensitive surface resource value areas (Figure 2-6 shaded area), operators may include in their submission for exception consideration to single pad multi-well drilling, a listing and description of voluntary measures (what, when, where, and how) that they propose to implement to reduce impacts to wildlife and wildlife habitat. This should include measures beyond the standard measures listed in Appendix A. They may include a combination of the following: (1) additional multi-pad/multi-well development of well facilities to reduce daily visits to the well; (2) centralizing condensate and produced water tanks, and/or (3) the area of long-term disturbance and to limit trips to well locations; (4) reclamation of two-track roads on-lease and off-lease not needed for production operations or livestock grazing operations; participation in the development and implementation of the Wildlife Protection and Impact Mitigation Plan, etc.

- Fontenelle Dam Protection. To ensure maintenance of the structural integrity of Fontenelle Dam, a radius of 1,500 feet from the dam is established as a buffer zone by Reclamation where any facilities or activities that could affect this structure will not be allowed on the dam structure or formations supporting the dam structure are prohibited. Also, limited activities (e.g., seismic blast holes) will be restricted within an additional 1,500-foot radius (3,000-foot total radius) around the dam that could affect the dam structure or formations supporting the dam structure, powerhouse, spillway, and instrumentation.

- Additional Mitigation Opportunities. Opportunities to reduce direct impacts to wildlife (e.g., vehicle-wildlife collision, etc.); identification and implementation of ways to reduce or off-set unavoidable loss of antelope/crucial winter range and nesting habitat for sage grouse and raptors (e.g., ripping and seeding selected two-track road sections not needed for well field operational activities or livestock operations; accelerate reclamation of all disturbed areas not needed for field operations; annual monitoring and reporting of the effects of development on antelope, sage grouse, raptors, and special status wildlife species within the Dallen and Lincoln Road project areas, etc.).

The BLM, with the cooperation of the Operators, WFGD, FWS, BOR, and other affected interests, will establish a review team within two months following the Record of Decision (ROD). The review team will be comprised of representatives from the Operators, using as a guide the outline provided in Appendix E of this ROD. A draft plan will be completed within six months of the date the ROD is issued and a final plan approved within one year following issuance of the ROD. Implementation of the plan will become an integral part of the Dallen and Lincoln Road Operator’s field development and operations.

- Recreational Petrified Wood Collection. A recreational petrified wood area exists within the Blue Forest Area which will continue to be open on a fee use basis for collection in limited quantities. No commercial collection will be allowed. All holes dug by collectors must be refilled and smoothed at the end of each collecting trip. A copy of the Rock Springs District policy pertaining to petrified wood collection is contained in Appendix F of this Record of Decision. Well pads, access roads, pipelines, and any other facilities will be located and constructed in a manner that will avoid unnecessary degradation of the petrified wood area and the recreational collection of the resource.

- Compliance and Monitoring. Appropriate remedial action will be taken by the Operations and/or the operators to address unacceptable impacts are identified. The Operators’ will be required to conduct monitoring of project sites in cooperation with the BLM. Plans submitted by the Operator or their contractor, and with each APD, ROW, or appropriate permit application, will include monitoring provisions for the following: road construction to approved standards, reclamation success, annual review of wildlife use and/or changes in use including listed or candidate species, or any threatened, endangered, or migratory bird species or their habitat in the area (including black-footed ferret habitat, raptor nests, and mountain plover nesting habitat), big game use, and sage grouse. The reclamation monitoring program shall include written documentation for the effectiveness and success of reclamation mitigation. The Operators’ shall monitor their reclamation to ensure that reclamation meets the accepted standards (i.e., 50 percent of predisturbance cover at 2 years and 80 percent at 5 years).

- Authorized Officer. The BLM Green River Resource Area Manager or his designee is the Authorized Officer (AO) for project surface and subsurface activities on BLMS. The cooperation of the designated land and resource management and monitoring activities may be modified by the AO as necessary to further minimize impacts. Final monitoring and monitoring requirements will be specified by the OAO after on-site inspections by BLM, private, or state landowner, and the Operator/contractor personnel and after input from BLM regional specialist on issues of concern. BLM could require additional field studies or documentation of project sites to ensure that reclamation and other resource protection goals are met.

RATIONAL FOR ADMINISTRATIVE REQUIREMENTS/CONDITIONS OF APPROVAL
This section briefly explains the rationale for the administrative requirements and conditions of approval.

- Authorizing Actions. Before implementation may occur, all necessary federal, state, and county permits must be obtained.

- Site Specific Environmental analyses. Because the EIS does not address all resource concerns site-specifically, further environmental review is necessary before the final location, mitigation and monitoring needs for each well site, access road, gathering pipeline segment, or other facility can be determined.

- Plans/Reports. The specified plans and reports are requirements of state and Federal law. The plans will ensure timely implementation and analysis to ensure orderly implementation of planned development.

- Road Development Plan-Transportation Plan. DALEN and Lincoln Road Operators are required to prepare transportation plans to comply with existing Federal, State, and County requirements and restrictions developed to protect road networks, the traveling public, adjacent landowners and their property, and the natural resources.

- Road Maintenance Agreement. A road maintenance agreement is necessary to ensure the proper collection and sharing the use of Collector and Local roads within the Fontenelle Projects area. To ensure necessary and timely repair and repair standards, and to prevent adverse resource impacts due to dust and increased sedimentation, operators will be required to enter into an agreement for road maintenance. Because county roads are included within the projects area, coordination with the county will be necessary.

- Air Quality. As required under the Federal Land Policy Management Act and the Clean Air Act, the federal land management and permitting process must ensure that air quality standards are met. The BLM, with the cooperation of the Operators, WFGD, FWS, BOR, and other affected interests, will establish a review team within two months following the Record of Decision (ROD). The review team will be comprised of representatives from the Operators, using as a guide the outline provided in Appendix E of this ROD. A draft plan will be completed within six months of the date the ROD is issued and a final plan approved within one year following issuance of the ROD. Implementation of the plan will become an integral part of the Dallen and Lincoln Road Operator’s field development and operations.

- Recreational Petrified Wood Collection. A recreational petrified wood area exists within the Blue Forest Area which will continue to be open on a fee use basis for collection in limited quantities. No commercial collection will be allowed. All holes dug by collectors must be refilled and smoothed at the end of each collecting trip. A copy of the Rock Springs District policy pertaining to petrified wood collection is contained in Appendix F of this Record of Decision. Well pads, access roads, pipelines, and any other facilities will be located and constructed in a manner that will avoid unnecessary degradation of the petrified wood area and the recreational collection of the resource.

- Compliance and Monitoring. Appropriate remedial action will be taken by the Operators’ in cooperation with the BLM. Plans submitted by the Operator or their contractor, and with each APD, ROW, or appropriate permit application, will include monitoring provisions for the following: road construction to approved standards, reclamation success, annual review of wildlife use and/or changes in use including listed or candidate species, or any threatened, endangered, or migratory bird species or their habitat in the area (including black-footed ferret habitat, raptor nests, and mountain plover nesting habitat), big game use, and sage grouse. The reclamation monitoring program shall include written documentation for the effectiveness and success of reclamation mitigation. The Operators’ shall monitor their reclamation to ensure that reclamation meets the accepted standards (i.e., 50 percent of predisturbance cover at 2 years and 80 percent at 5 years).

- Authorized Officer. The BLM Green River Resource Area Manager or his designee is the Authorized Officer (AO) for project surface and subsurface activities on BLMS. The cooperation of the designated land and resource management and monitoring activities may be modified by the AO as necessary to further minimize impacts. Final monitoring and monitoring requirements will be specified by the OAO after on-site inspections by BLM, private, or state landowner, and the Operator/contractor personnel and after input from BLM regional specialist on issues of concern. BLM could require additional field studies or documentation of project sites to ensure that reclamation and other resource protection goals are met.
Service concerns pertaining to potential significant impacts to air quality related values within the Bridger Wilderness and in response to the mandates of the Clean Air Act and Wilderness Act to ensure the protection of wilderness resources under Federal administration. The following explains the basis for the various air quality component decisions.

Emissions Per Well Site and Compressor Site - The air pollutant emissions limitations specified are based upon the analysis assumptions used in the Moxa Arch and Fontenelle EISs - Air Quality Technical Support Document - Cumulative Impact Analysis of Southwestern Wyoming Natural Gas Development Projects on Air Quality (Section 2.2 and Appendix A of the Cumulative Impact Analysis) which included the application of current Best Available Control Technology (BACT) to compressors. The specified limitations are consistent with the Section 10 Permit Requirements for Air Quality Standards & Regulations for crude oil and natural gas production facilities.

Visibility Cap - The Moxa Arch and Fontenelle EISs Cumulative Impact Analysis found that "worst case" NO, emissions associated with the development of the proposed natural gas projects (Fontenelle, Moxa Arch, Stagecoach Draw, and Jonah Prospect), when added to existing NO, emissions to southwestern Wyoming, could result in a percent change in visual range reduction (less than 1.0 degree reduction for the 90th percentile, or clearest days) on twenty-six days annually (eight days of the non-winter period, and eighteen days during winter) within the PSD Cl I Bridger Wilderness Area. Under the "less conservative" emissions scenario, no days exhibited significant (perceptible) visual range reduction. The "less conservative" emissions scenario is the more realistic development scenario for the Moxa Arch, Fontenelle, Stagecoach Draw, and Jonah projects.

In contrast, the USDA-Forest Service, in an independent modeling of "worst case" NO, emissions associated with the development of the proposed natural gas projects, based upon their established limit of acceptable visibility change of 0.5 degree, found that when added to existing NO, emissions in southwestern Wyoming, there could be a perceptible visual range reduction on 153 days annually within the PSD Cl I Bridger Wilderness Area. The USDA-Forest Service indicated that limiting total NO, emissions to 977 tons per year from new emission sources in southwestern Wyoming, including the Moxa Arch, Fontenelle, Stagecoach Draw, and Jonah projects, would result in limits of acceptable change for visibility to be exceeded no more than one day per year. This is the basis for the total NO, emissions cap of 977 tons per year for the BLM Rock Springs District, including the Moxa Arch, Fontenelle, Stagecoach Draw, and Jonah development projects.

The differences in the BLM and USDA-Forest Service air quality visibility analyses are due to differences in analysis procedures, modeling input assumptions, and modeling techniques which have led to differences in potential impact conclusions. The BLM selected the more conservative NO, emissions cap of 977 tons per year for three reasons: 1) to respond to the mandates of the Clean Air Act and Wilderness Act to ensure the protection of wilderness resources under Federal administration, 2) in recognition of the USDA-Forest Service concern regarding impacts to air quality related values within the Bridger Wilderness, and 3) the establishment of the Wyoming Governor’s Interagency Committee on Air Quality provides an official forum to evaluate available data and analyze, including air quality permit provision assumptions, the goal of which will be to reach consensus regarding air quality management in southwestern Wyoming.

Interagency Committee recommendations are anticipated within three to four years of this ROD or some other information source(s) may submit substantiated recommendations sooner. A recommendation to change the NO, emissions cap must be based upon supporting technical analysis of regional visibility impacts.

As stated in the decision, the total NO, emissions threshold of 782 tons per year is not a cap for authorized development on federal lands within the Rock Springs District, including the Moxa Arch, Fontenelle, Stagecoach Draw, and Jonah development projects. Rather, it is the point to which re-evaluation would occur to provide timely management review before the total NO, emissions cap of 977 tons per year is reached.

Atmospheric Deposition

The Cumulative Impact Analysis (Sections 5.5 and 6.1) found that "worst case" NO, emissions associated with the development of the proposed natural gas projects (Fontenelle, Moxa Arch, Stagecoach Draw, and Jonah Prospect) would be below applicable significant criteria for atmospheric deposition. These criteria included potential nitrogen deposition less than 3 kg/ha/yr, sulfur deposition less than 0.0005 kg/ha/yr, acidity change less than 0.1 pH, and a change in Acid Neutralizing Capacity (ANC) less than 10 percent (for lakes with background ANC above 25 microequivalents per liter (µeq/L)).

The USDA-Forest Service independent analysis reached the same conclusions. However, the USDA-Forest Service additionally noted that operation impacts would exceed applicable significance criteria in lakes with ANCs below 25 microequivalents per liter.

However, no additional air quality mitigation was determined to be necessary to further reduce potential atmospheric deposition impacts to low ANC lakes for the following reasons: 1) under the Wyoming Air Quality Standards and Regulations, the DYQW will encourage offsetting or reducing NO, emissions from proposed or existing activities when permitting new emission sources or processing permit renewals within southwest Wyoming; 2) modeling, including input modeling, which would examine expected emissions from specific project components (such as compressors) prior to their construction; 3) the Wyoming DEQ requires that a site-specific BACT analysis be conducted by the proponent as part of its pre-construction permit application and requires BACT be applied in all air quality permits; 4) all Federal actions require additional site specific air quality analysis by the Federal agencies and additional emission control measures may be required to ensure protection of air quality resources; and 5) the Wyoming DEQ expects to see significant decreases in NO, emissions within southwest Wyoming from existing sources as a result of implementation of the Clean Air Act Amendments of 1990 through the Acid Rain Program and the Section 30 Operating Permit Program. These requirements will help mitigate potential NO, emissions impacts.

Mitigation

No additional air quality mitigation was determined necessary to further reduce potential air quality impacts for visibility, atmospheric deposition, or near field impacts (e.g., dust suppression, VOC and HAPs reduction) for the following reasons: 1) for the reasons listed above under "Atmospheric Deposition"; 2) because construction and operation would meet all applicable National Ambient Air Quality Standards and Wyoming Ambient Air Quality Standards; 3) potential emission levels would comply with applicable Prevention of Significant Deterioration (PSD) Class I and II Increments; and 4) pollutant concentrations during operation would not "overlap" between well locations, even with the densest assumed well spacing.

As described in the Visibility sections above, total NO, emissions from future permit authorizations (including rights-of-way, permits, and applications for permit to drill) shall be limited (capped) to 977 tons per year within the Rock Springs District, including the Moxa Arch, Fontenelle, Stagecoach Draw, and Jonah development areas. This emission cap corresponds to the USDA-Forest Service recommendation that limiting total NO, emissions to 977 tons per year from the area within the BLM Rock Springs District, including the Moxa Arch, Fontenelle, Stagecoach Draw, and Jonah projects, would result in limits of acceptable change for visibility to be exceeded no more than one day per year. The 977 tons per year emissions cap will remain in effect until the Interagency Committees on Air Quality, or other information source, provide recommendations that it should be changed based upon supporting technical analysis regarding potential regional visibility impacts.

The total NO, emissions threshold of 782 tons per year within the Moxa Arch, Fontenelle, Stagecoach Draw and Jonah development areas is also identified as the point at which re-evaluation of potential visibility impact shall be conducted for timely management review before the total NO, emissions cap of 977 tons per year is reached.

Both the total NO, emission cap and further analysis threshold are binding only on future federal actions authorized on federal lands.

Monitoring:

Based on the preceding descriptions of potential impacts, and identified mitigation measures, no additional air quality monitoring requirements are necessary to measure and evaluate potential air quality impacts. The BLM will continue to cooperate with existing visibility and atmospheric deposition impact monitoring programs. Additional monitoring needs may be identified by the Interagency Committees on Air Quality.

The BLM will be responsible for maintaining communication with the Wyoming DEQ to monitor available NO, increment and to ensure Federal authorizations do not exceed the total NO, emissions cap. Implementation of this decision requires close coordination between the federal land management and state permitting regulatory agencies regarding receipt of applications for permits of less than 5 acres or NPDES permits and review of the emissions inventory. Wyoming DEQ will monitor and track NO, emission levels within the Rock Springs District, including the Moxa Arch, Fontenelle, Stagecoach Draw, and Jonah development areas, and share data with the BLM and other interested agencies as requested.
**Special Status Species.** The measures listed under this section are required to comply with the Endangered Species Act. Species listed here and in Appendix A will be afforded full protection. Changes in the scope of the project and its impacts require notification of the USFWS and the WQFD to cooperate with the project proponents to implement and maintain the protection and mitigation measures as stipulated.

**Raptor Nest Protection.** The buffer zone established around active raptor nests is to be the future functional use of raptor nests and raptor roosting topography of young following construction and drilling operations. The buffer is based upon the findings of several research studies designed to determine raptor flushing distances due to human activity.

**Mitigation and Monitoring.** This measure is intended to support the implementation of the resource protection, protection, and monitoring measures found in Appendix A, including monitoring programs, study, and operator monitoring summary. Environmental Compliance personnel and/or periodic interdisciplinary team field review to ensure that the mitigation measures are effective and implemented.

**Big Game Crucial Winter Range Disturbance.** This measure is to be specified to emphasize the RPA anticipated long-term effects of disturbance associated with well pads and access roads. The area of disturbance caused by implementation of the resource protection, protection, and monitoring measures found in Appendix A will be applicable.

**Sensitive Resource Value Protection.** This measure is to be specified to emphasize the RPA anticipated long-term effects of disturbance associated with well pads and access roads. The area of disturbance caused by implementation of the resource protection, protection, and monitoring measures found in Appendix A will be applicable.

**Recreational Petrified Wood Collection.** Due to concerns over the placement of well pads, access roads, and pipelines within and the 500 to 600 acre Blue Forest petrified wood site which will continue to be open for collection in limited quantities, well pads, access roads, pipelines, and any other infrastructure found within this area will be avoided to degrade or interfere with this recreational resource.

**Compliance and Monitoring.** Because of the importance of mitigation to avoid or minimize adverse impacts, implementation of an intensive monitoring program by the Operators is **essential**. Guidelines for monitoring will be developed by the Operators in cooperation with BLM, Wyoming DEQ, and other agencies as appropriate, in accordance with this decision. The Operators', or their contractors, will conduct monitoring in accordance with the provisions of this decision. The Operators' and the BLM will provide qualified representatives on the ground during and following the operations to verify surface resource values (shaded area in Figure 2-6). BLM will require operators to further consider moving to well locations or drilling multiple wells (e.g., directional, horizontal, conventional) from an existing pad on a case-by-case basis where it is determined to be realistic and economical.

Where it is determined not to be reasonable or economical to avoid or minimize adverse impacts, implementation of specific mitigation measures will be required for exceptions consideration a listing and description of measures (including voluntary measures) they propose to implement to reduce resource impacts.

**Footprint Dam Protection.** This measure is emphasized for safety reasons and to ensure maintenance of the structural integrity of Footprint Dam.

**Additional Mitigation Opportunities.** The EIS identified additional opportunities to mitigate residual impacts. These measures have been incorporated into Appendix A and will be applicable.

**Wildlife Protection and Impact Mitigation Plan.** The Footprint water project is designed to mitigate the biodiversity and habitats. To ensure protection is maximized to the extent provided by law, including what is reasonable and practicable, the BLM will require the preparation and implementation of a wildlife protection and impact mitigation plan for the Footprint Projects area. This plan will be prepared by the Operators in consultation with BLM, WQFD, FWQ, and other interested parties.

**Construction.** The EIS prepared on the Footprint Natural Gas Infill Drilling Projects will provide implementation of the natural gas development; however, it is not the final environmental review upon which approval of all actions in the area will be based. Site-specific measures will be specified and required for each well and associated access roads, pipelines, and other actions in accordance with the BLM National Environmental Policy Act Handbook (H-1970-1). Documentation will be on Wyoming State Office Form WY-1792-08. This provision for site specific evaluation of environmental protection needs will ensure that there is optimum consideration given to resource protection.

**Authorized Officer.** Self explanatory.

**SUMMARY OF DALEN AND LINCOLN ROAD OPERATOR'S PROPOSED DEVELOPMENTS**

The Footprint Natural Gas Infill Drilling Projects area is located on approximately 2,085 acres in the foothills of the Laramie Mountains in northwestern Lincoln County, Wyoming. The project area is within Sweetwater and Lincoln Counties and the Green River Resource Area of the BLM's Rock Springs District (Figures 1-1, 1-2, and 1-3). The Footprint Projects (i.e., collectively the DALEN Footprint II Unit project and the Lincoln Road Operators project) are located along the east side of Footprint Reservoir and east of portions of the Green River north and south of the reservoir. Under the proposed action, the proposed well site (collectively up to 1,317 new wells) would tap gas resources in the Frontier Formation at depths ranging from 7,000 to 9,000 feet at a spacing of 160 and 80 acres. Production from each well would be approximately 1.8 billion cubic feet (BCF) of gas (gross) with the potential to recover over 2 trillion cubic feet of gas (net) over the life of the project. The proposed action, which includes the construction of approximately 330 wells and associated pipelines and roads in the project area at the time the EIS was initiated, is a significant project.

**Construction of approximately 36 miles of road to access individual well sites.**

Drilling and construction activities would occur over a ten year period and possibly beyond; it would be scheduled annually during dry weather conditions in the summer and fall. Up to 4 rigs would be used each year between June and the end of November, depending on weather conditions. DALEN's schedule is designed to conform with restrictions imposed on crucial wildlife winter ranges and to avoid excessive damage to soils during wetter portions of the year.

Of the 25,323 acres in the DALEN development area, administration by ownership is as follows: 21,579 acres BLM, 520 acres BOR, 1,290 acres State, and 1,104 acres private. An estimated 803 acres would be disturbed primarily by construction activities, of which 308 acres would be reclaimed and restored shortly after disturbance. An estimated 3,500 acres would remain disturbed for the life of the project.

Drilling and production will be contingent upon adequate gas prices at the wellhead. Gas will continue to be gathered within the unit through existing DALEN-owned pipelines and delivered to Williams Field Services and FMC Corporation existing transmission pipelines.

**Lincoln Road Operators Project.** The Lincoln Road Operators operated approximately 330 wells and associated pipelines and roads in the project area at the time the EIS was initiated. The Lincoln Road Operators proposed to continue to infill their leased acreage as follows:

- Drilling, completing, testing and producing up to 1,096 additional gas wells within the project area.
- Drilling additional wells on 80-acre and 160-acre spacing.
- Construction of approximately 31 miles of new road to access individual well sites.
- Construction of approximately 140 miles of new wellhead pipeline to connect the infill wells to the existing pipeline and gathering systems already operating in the project area; and
- Construction of approximately 242 miles of joint pipeline.

Drilling and construction activities would occur over a ten year period and beyond; drilling would occur year-round, except within crucial wildlife winter range or other seasonally restricted periods where drilling would occur from early June through the end of November; a peak of 70 wells would be drilled per year (although for analysis
purposes the EIS assumed a peak of 150 wells per year; up to a maximum of 7 rigs could be used each year, depending on weather conditions. The Lincoln Road Operator’s schedule is designed to also conform with restrictions imposed to avoid excessive damage to soils during wetter portions of the year.

Of the 154,425 acres in the Lincoln Road development area, administration by ownership is as follows: 103,309 acres BLM, 50,350 acres BOR, 539 acres State, and 227 acres private. An estimated 7,137 acres would be disturbed initially by construction activities, of which 5,444 acres would be reclaimed and reused shortly after disturbance. A total of 1,693 acres would remain disturbed for the life of the project.

Drilling and production will be contingent upon adequate gas prices at the wellhead. Gas will continue to be gathered within the Lincoln Road project area and delivered to Williams Field Service and Western Gas Resources Company.

ALTERNATIVES CONSIDERED TO THE DALEN AND LINCOLN ROAD OPERATOR’S PROPOSED DEVELOPMENT

Three natural gas development alternatives were evaluated in the Fontenelle Natural Gas Infill Drilling Project EIS. The Resource Protection Alternatives (RPAs), which were developed for the DALEN and the Lincoln Road Operator’s projects to comply with one of the primary goals of NEPA — the avoidance and minimization of impacts to the human environment; the Staged Development Alternative, which attempts to reduce or avoid more serious, concentrated impacts to certain resource values by spreading development out over a longer time period; and the No Action Alternative, which would deny approval of the DALEN and Lincoln Road Operator’s proposal to further develop their leases; i.e., surface disturbance associated with access roads, pipelines, and well sites to continue infill development of leases. The No Action Alternative assumed that only the existing development (429 active wells and associated access roads and pipelines) would remain until abandonment and reclamation. A description of the alternatives follows.

Resource Protection Alternatives

As stated above, the Resource Protection Alternatives (RPAs) were developed to comply with one of the primary goals of NEPA — the avoidance and minimization of impacts to the human environment. The process used to develop this alternative was based on: 1) an evaluation of development and construction techniques proposed by DALEN and the Lincoln Road Operators (i.e., the disturbance associated with each facility); 2) proposed timing of construction of project components; and 3) the specific location of facilities proposed by DALEN and the Lincoln Road Operators. Implementation of these alternatives would require changes to many aspects of the Proposed Actions (PAs). A comparison of the estimated construction- and production-related disturbance associated with the PAs and the RPAs are provided on Table 2-4. Overall, implementation of the RPAs would result in less disturbance than implementation of PAs. The number of wells drilled (by township) for the PAs and RPAs is compared in Figure 2-5.

DALEN’s Resource Protection Alternative

Appendix D of this Record of Decision provides a list of recommended changes to DALEN’s Proposed Action that constitute the DALEN RPA. The RPA would eliminate 12 wells (depending on site-specific surveys) from the Proposed Action for the reasons listed in Appendix D. In addition, 22 wells would be moved to avoid resource conflicts. Figure 2-5 shows number of wells in the PA in comparison to the RPA.

Lincoln Road Operator’s Resource Protection Alternative

Appendix D provides a list of RPA recommended changes to the Lincoln Road Operator’s Proposed Action. The RPA would eliminate 77 wells from the PA. In addition, 18 wells would be moved to avoid resource conflicts. The general types of changes recommended for the DALEN and Lincoln Road Projects, for which the environmental consequences were analyzed in detail in the draft and final EIS, are briefly described below:

- Moving Well Locations: The companies’ PA well locations were based solely on spacing requirements. Typically, this results in well sites being selected in the center of a quarter section or quarter/quarter sections. Well spacing does not consider potential environmental conflicts and in reality the BLM could never allow development to occur based on this simple spacing concept. The RPAs were based on a comparison of resource values and PA well locations. Where conflicts were found, an alternative well site location was selected in the same quarter section or quarter/quarter section that avoided or minimized the conflict between the well site and the resource value. In some cases, the new well locations would require directional drilling.

![Figure 2-6 Sensitive Resource Values Area](image-url)
Eliminating Well Sites. In some cases, particularly where wells are proposed on 80-acre spacing, it was not possible to identify a location in the same quarter/quarter or quarter section that avoided or minimized the conflict with the resource of concern. Moving the well outside the quarter section or quarter/quarter section would create reservoir drainage problems because two wells would be draining the same area. Where these situations occurred, the RPAs recommended eliminating or relocating the well.

Seasonal Construction Constraints. In portions of the project areas, well drilling activities would result in conflicts with other resources if drilling activities occurred during certain times of the year. In these cases, the RPAs proposed a timing window where drilling could occur without conflicting with the resource value. The RPAs assume the operators will be able to drill within the recommended timing window. If drilling cannot be within the window, the RPAs assume the well will not be drilled until the next season.

Directional Drilling Considerations. Directional drilling of several wells from a single, existing well pad was suggested as a means of reducing surface disturbance and impacts to wildlife habitat in the DALEN and Lincoln Road project areas. The RPAs incorporated 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. (Figure 2-6). The RPAs assumed BLM would require the operator/tenants, in areas of sensitive surface resources, to consider directional drilling or to drill from an existing pad where four well pads already exist within a section.

It was thought that, although once quite costly and heavy with risk, directional drilling technology had advanced such that the additional costs of directional drilling could be offset and a savings to an operator could be realized when factoring in directional drilling from an existing pad where the costs associated with construction of an access road, well pad, and production facilities are greatly reduced by using common facilities on multi-well pads. However, comments received on the DEIS suggested these assumptions were not valid, that a blanket requirement to directional drill the 5th, 6th, 7th, or 8th well, each from an existing pad, once four well pads existed within a section should be revised and additional analysis completed by the BLM Wyoming Reservoir Management Group [an in-house group of BLM experts in oil and gas drilling and reservoir management]. Such analysis was completed and presented in the final EIS. Directional drilling consideration was revised for reasons identified in the following discussion.

The analysis conducted by the BLM Wyoming Reservoir Management Group for the Fontenelle projects area, shows that a blanket requirement of directional drilling from an existing pad where four well pads already exist within a section would be uneconomical and unreasonable. Replacing one conventional well with a directional well drilled from an existing well pad would avoid surface disturbance caused by a new well pad, access road, and gathering pipeline construction. Based upon the assumptions included in the analysis, as well as the affected environment, resource values, and impacts discussed in the draft and final EIS, to require a company to expend an additional $50,000-65,000 or more to directionally drill a well to avoid up to 4.1 acres of construction-related disturbance or 0.9 acres of long-term, production-related disturbance would be unethical and an unreasonable expectation of the lessee.

Forced directional drilling could mean that a number of wells would not be drilled and thus a resource wasted (−200 wells @ 500 MCFG/D = 100 MMCFG/D 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 reducing the disturbance associated with the construction of gathering pipelines by reducing the zone of vegetation disturbance during pipeline installations; reclaiming old seismic trails or other two-track trails and roads not necessary for oil and gas field operations or other uses; co-mingling 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.

Therefore, an alternative that includes directional drilling as a blanket requirement was not examined further in the EIS. However, directional drilling would still be a significant issue.
required consideration on a case-by-case basis in the sensitive surface resource value areas shown in Figure 2-6.

No Action Alternative

Analysis of the No Action Alternative provided a benchmark enabling the decisionmaker to compare the magnitude of environmental effects from the Proposed Actions and the Resource Protection Alternatives. The No Action Alternative assumes no further authorizations for development would be granted on public lands (97.8 percent of land ownership) within the Fentonnelle area. It would deny the actions proposed as well as any alternatives. Natural gas recovery would be limited to that presently being produced from approximately 429 active wells within the Fentonnelle Project areas or 901 active wells within the cumulative impact study area, and continued use and maintenance of access roads and pipelines within the project areas.

Because the DALEN and the Lincoln Road Operator’s leases and their proposals to develop their leases are in conformance with existing planning guidance for managing the area, and because the Resource Protection Alternative demonstrates that the unacceptable adverse impacts associated with the implementation of the development could be mitigated, the denial of development would not be a reasonable exercise of discretion. Unacceptable adverse impacts are not anticipated. The need to preclude a company from occupying the surface (as in the case of a lease with a No Surface Occupancy stipulation) cannot be justified. Given the findings of the environmental analysis, the issuance of the leases to DALEN and the Lincoln Road Operator’s with the resource protection stipulations included in the leases, appears to have been appropriate.

The actions analyzed in the EIS concern development of existing leases (a valid existing right to develop the leased resource) issued to DALEN and the Lincoln Road Operators. To ensure the reviewing public understood, the draft EIS included reference to judiciary pertaining to limitations on the BLM’s authority to implement the No Action Alternative where the proponent has a valid existing right. Nevertheless, the Secretary of Interior has the authority and responsibility to protect the environment within Federal oil and gas leases, and restrictions can be imposed on the lease terms by BLM. These restrictions appear in the form of lease stipulations, or in the case of post-lease situations where further protection of a resource is warranted, as the BLM’s standard stipulations and conditions of approval developed through the NEPA analysis process.

As explained in the EIS, an oil and gas lease grants the lessee the right and privilege to drill for, mine, extract, remove, and dispose of, oil and gas deposits in the leased lands, subject to the terms and conditions incorporated in the lease. On land leased without a No Surface Occupancy stipulation, the USDI cannot deny the permit to drill but can only impose mitigation measures. In the absence of a No Surface Occupancy stipulation covering the entire lease, restrictions based on oil and gas lease operations must be “reasonable” and cannot directly or indirectly prohibit, altogether, the development of the lease. Although an individual AFO can be denied, the right to drill and develop somewhere on the leasehold cannot be denied by the USDI. To deny all activity would constitute a breach of contract and violate an operator’s right to conduct development activities on the leased lands. Authority for complete denial can only be granted by Congress, which can order the lease forfeited and reclassified to compensation (Union Oil Company of California v. Morton, 512 F.2d 743, 750-51; 91st Cir. 1975).

Also, Federal Regulation (43 CFR 3162 - Requirements for Operating Rights Owners and Operators) further constrain that which may constitute reasonable restriction in the development of a lease, the regulation states: “The operating rights owner or operator, as appropriate, shall comply with applicable laws and regulations ... These include, but are not limited to conducting all operations in a manner ... 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.” (Emphasis added.)

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

Directional Drilling

A blanket requirement for directional drilling once four well pads exist within a section was not analyzed in detail for reasons indicated under the Resource Protection Alternative above.

Staged Development Alternative

This alternative was not suggested during scoping; however, in response to public comment received on the
DEIS, this alternative was considered but not examined as a separate alternative for the following reasons.

The purpose of staged development is to reduce or avoid more serious, concentrated impacts to certain resource values by spreading development out over a longer time period. However, the Pts and RPs are not the only components of a DEIS. This alternative is only one of several opportunities which are constantly being weighed against continued development in the Fontenelle area. Improving technologies could extend the life of an existing well or field or offer additional opportunities for infill drilling within an existing field.

Some have suggested that, for 80-acre spacing development, BLM could stage development in a manner that would allow the operator to build four pads and drill four wells in the potential hot spots or high production areas within a section (640 acres), then, when these wells cease production, reclaim the sites and proceed to build four more pads and drill four more wells in the section. This is not realistic because reservoir characteristics are such that this form of staged development would affect reservoir pressures and could result in a significant loss of the natural gas resource.

Nevertheless, the concept and benefits of "staged development" have already been incorporated into the Pts and RPs by providing for its occurrence over a period of 10 years or more. For these reasons a separate "staged development" alternative was not analyzed further in this document.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

In accordance with the Council on Environmental Quality (CEQ) Regulations (40 CFR 1502.2b), the environmentally preferred alternative must be identified in the Record of Decision. The BLM environmentally preferred alternative is the Resource Protection Alternative (RPA) for the DALEN and Lincoln Road Projects. The BLM believes that under this alternative all reasonable and practicable means to avoid or minimize environmental harm from the proposed development have been identified and a mechanism by which they may be identified has been provided for (e.g., Wildlife Protection and Impact Mitigation Plan, Transportation Planning, Storm Water Discharge Plan, Emergency Committees on Air Quality, etc.), and that a monitoring and enforcement program will be structured to assure implementation.

The DALEN and Lincoln Road Operators RPs are preferred because they: 1) incorporate the added development to comply with all Federal, State, and other regulatory requirements during construction, drilling, completion, and field production operations; 2) incorporate the consideration to modify facility designs, construction techniques, operating practices, and abandonment and reclamation procedures to avoid or minimize environmental impacts; 3) incorporate EPA and Wyoming Department of Environmental Quality best management practices (BMPs) for storm water discharge prevention which would minimize off-site sedimentation and erosion by protecting soils; 4) ensure protection of air quality related values within the Class I wilderness areas of the Bridger-Teton and Shoshone National Forests by imposing a cap on NOx emissions; 5) incorporate appropriate and reasonable measures from the draft and final EIS that provide further opportunity to avoid or reduce impacts, provide for monitoring and enforcement as required by the agencies and Operators which will ensure implementation of the mitigation, evaluation of its functional effectiveness, and ensure successful reclamation; and 6) describe the relocation of project facilities and/or directional or horizontal drilling to avoid impacts to steep slopes, wetlands, historical trails, streams, sage grouse leks, raptor nests, other sensitive surface resource values, including the Seedskadee National Wildlife Refuge. The BLM believes that the RPs meet the requirements of Federal Regulation 43 CFR 3162.1(a), directing lessees and/or operators to conduct ...all operations in a manner which ensures the proper handling, management, and disposal of solid waste and air emissions; 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." MANAGEMENT CONSIDERATIONS

The decision to approve the Fontenelle Projects as described in the Resource Protection Alternatives (RPs) and subject to the Field Development require and conditions of approval, will allow the full development of the Fontenelle natural gas reserve. This land use will become a dominate use, but not to the exclusion of other existing principal and minor uses (i.e., domestic livestock grazing, fish and wildlife development and utilization, mineral exploration and production, rights-of-way, and outdoor recreation) as defined in Section 103(0) of FLPMA. The Fontenelle Projects have been under development since early 1979 and will continue to be developed for the next 30 to 50 years until maximum recovery of the natural gas resource has occurred.

BLM recognizes the impacts that implementation of the Fontenelle Projects will have on the natural and physical environment, which is much more difficult to understand and predict than impacts caused by other activities. BLM believes that environmental impacts are much more difficult to understand and predict than impacts caused by other activities. BLM believes that environmental impacts are much more difficult to understand and predict than impacts caused by other activities.
nature in a way that results in the least degree of irreversible, irreversible commitment of resources. The long-term productivity of the area will either be lost, or not substantially reduced, as a result of approving the Fontenelle Projects as constrained under the RPA's. The only irretrievable resource will be natural gas.

The decision to approve the Fontenelle Projects includes careful consideration of the following factors: a) consistency with land use and resource management plans; b) public involvement, scoping issues, and draft and final EIS comments; c) management considerations based upon relevant public comments received; d) agency statutory requirements; e) national policy; and f) measures to avoid or minimize environmental harm. A brief discussion on each of these factors follows:

a) Consistency with Land Use and Resource Management Plans - The decision to authorize the Fontenelle RPA's is in conformance with the overall planning direction for the area. The programmatic Big Sandy/Salt Wells Oil and Gas EA and Big Sandy Management Framework Plan (MFP) state that public land in the area of the Fontenelle Projects is "...open to oil and gas leasing and subsequent development." It also states that "standard" and "special" protective stipulations to be applied to development and implementation will be on an "as needed" basis to prevent undue adverse impacts to other resource values. Standard and special protective measures were identified and incorporated by the D ALEN and Lincoln Road Operator into the RPA's to reduce or eliminate adverse impacts.

b) Public Involvement, Scoping Issues, and EIS Comments - Opportunity for public involvement was provided throughout the environmental process. Scoping for issues and alternatives was initiated on December 16, 1994 with the issuance of a Federal Register Notice of Intent, scoping notice, and project release. Twenty responses were received to the scoping notice. A summary of the scoping issues is found on page 1-9 of the Fontenelle National Gas Infill Drilling Projects Draft EIS. Over 300 copies of the draft EIS were distributed to the public for review and comment on April 13, 1995. On April 22, 1995, the Sweetwater County Commissioners sponsored a public information meeting at which they asked BLM to inform attending public about the BLM Rock Springs and Rawlins Districts federal oil and gas development activity within Sweetwater County. Notice of the meeting was announced three different times in the local newspaper and on the local radio stations. The meeting was held at 7 PM at Western Wyoming Community College. Approximately 50 people attended. The Fontenelle, Mossa Arch, Texas Stagecoach Draw, Greater Wamsutter II, BTA Bravo, HS Resources, and other proposals were briefly discussed and their locations identified on a map. No comments or questions were received specifically about the proposed project. However, concern was expressed about the level of development that was occurring within southwest Wyoming and the cumulative effects they were bound to have on wildlife, air quality, and the industrialization of the landscape from development.

A total of 20 comment letters were received by BLM on the draft EIS during the public comment period (April 14, 1995 through June 6, 1995). Individual comments or questions were ultimately those that presented new data or questions on new issues bearing directly on the effects of the proposed action (and its alternatives) were identified and included in the final EIS released May 1, 1996. Three new issues were identified that had not been identified during the initial scoping. These were air quality cumulative impacts (particularly impacts to air quality related values within the Wind River Mountain Range wilderness areas of the Bridger-Teton and Shoshone National Forests), directional drilling feasibility, and staged development. An addendum to the final EIS was prepared for each of these additional issues. A list of the commenters, the comment letters, and the BLM response to the comments are found in the final EIS. Because of the new issues, a 45-day review and comment period was provided on the final EIS (May 10, 1996 through June 24, 1996).

Eighty-four individuals provided comment in letters received on the final EIS. The individual comment letters are on file in the Rock Springs District, Green River Resource Area Office and may be reviewed by any interested party by contacting the Green River Resource Area Manager. A list of commenters can be found in Appendix H.

Comments ranged from total support for implementation of the Fontenelle Projects to support for implementation but with concern regarding impacts to various resources (wildlife, recreation, air quality) or commenter opposed the Fontenelle projects but did not oppose oil and gas development. A number of the comments were essentially opinions expressed regarding real or perceived impacts from oil and gas development. The comments, and the range of opinion expressed in them, reinforce the observations that there are diverse and, at times, conflicting values and preferences regarding natural resource development projects among various segments of the public. Although statements of opinion have not been responsible for action, this document recognizes that such comments provide useful insight into public perceptions of the proposed projects. Substantive comments received on the final EIS have been grouped into areas of common concern and responses provided in Appendix H of this Report of Decision.

c) Management Considerations Based Upon Relevant Public Comments Received - Several commenters on the final EIS raised similar concerns. These concerns have been grouped into areas of common concern and are addressed in Appendix H. All concerns have either been specifically provided for in the ROD or explanation provided in the response. Five areas of concern were:

1) Concern over Air Pollution Impacts - Particularly Visibility and Acidification of Lakes - Within High Mountain Wilderness Areas. The Wyoming Outdoor Council, Sierra Club Legal Defense Fund, Yellowstone Coalition and several individuals, as well as the USDA-Forest Service and Environmental Protection Agency concerned that authorization of the Fontenelle and Mossa Arch natural gas infill development projects would cause serious impacts to the air quality related values of the wilderness areas within the Bridger-Teton and Shoshone National Forests.

2. Concern by the American Lands Access Association (ALAA) and 34 of their members that Blue Forest Petrified Wood Area would not be protected and would become unviable as a recreation resource and/or lost to oil and gas development.

3) The Wyoming Outdoor Council, National Wildlife Federation, Sierra Club, Yellowstone Coalition and several individuals expressed concern that impacts to wildlife and wildlife habitat had not been adequately addressed. They also expressed concern that the EIS lacked credible, effective and committed mitigation for wildlife. That an effective and innovative mitigation program was needed.

4) The Wyoming Outdoor Council, National Wildlife Federation, Sierra Club, and Yellowstone Coalition believe that a programmatic or Green River Basin-wide cumulative environmental impact statement is needed to address the cumulative effects of mineral development on the natural resources in southwest Wyoming.

5) The Wyoming Outdoor Council, National Wildlife Federation, Sierra Club, Yellowstone Coalition and several individuals expressed concern that multiple-use of the Public Lands is not occurring.

d) Agency Statutory Requirements - The BLM decision is consistent with all federal, state, and county authorizing actions required to implement the D ALEN and Lincoln Road Operator's proposed actions (Appendix A, Table 1-1). All pertinent statutory requirements applicable to this proposal were considered. These include consultation with the USFWS regarding threatened, endangered, and candidate species under the ESA, particularly with regard to wildlife, environmental quality, and oil and gas conservation; and Sweetwater and Lincoln County Commissioners for coordination of construction and use permits.

e) National Policy - Private exploration and development of federal oil and gas leases is an integral part of the BLM oil and gas leasing program under authority of the Mineral Leasing Act of 1920 and the Federal Land Policy and Management Act of 1976. The United States continues to rely heavily on foreign energy sources. Authorization for the lessees to exercise their rights in developing the oil and gas leases is necessary to encourage development of domestic oil and gas reserves to reduce the United States' dependence on foreign energy supplies. Also, natural gas is this Nations "energy-of-choice" because it is clean burning and less polluting. Therefore, the decision is consistent with national policy.

f) Measures To Avoid or Minimize Environmental Harm - The adoption of the RPA's and the mitigation measures identified in the Fontenelle Natural Gas Infill Drilling Projects Final EIS and Final EIS and contained in this document represent all practicable means to avoid or minimize environmental harm. To ensure that the environmental consequences of the field development activities will be minimal, not only are the required environmental safeguards and resource protection measures prescribed by the Big Sandy MFP and the Big Sandy/Salt Wells Oil and Gas EA incorporated in the EIS, but additional protection measures have been incorporated from the Green River Resource Management Plan Final EIS; and public, local, state, and other federal agency input has been given full consideration. Implementation of the cap on NOX, emissions, the committed mitigation
and avoidance and minimization of impacts to the human environment as specified in the RPAs; implementation of the standard operating procedures for surface-disturbing activities; development and implementation of a wildlife protection and impact mitigation plan; and implementation of the reclamation and reclamation monitoring guidelines (Appendix A), no substantive issues remain unresolved as raised by governmental agencies, industry, or individuals.

APPEAL

This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR 3165.4(c). If an appeal is filed, your notice of appeal must be filed in this office (Bureau of Land Management, State Director, P.O. Box 1828, Cheyenne, Wyoming 82003) within 30 days of the date BLM publishes their notice of the decision in the Casper Star Tribune. The appellant has the burden of showing that the decision appealed from is in error.

If you wish to file a petition (pursuant to regulation 43 CFR 3165.4(c)) for a stay (suspension) of the effectiveness of this decision during the time that your appeal is being reviewed by the Board, the petition for a stay must accompany your notice of appeal. A petition for a stay is required to show sufficient justification based on the standards listed in 43 CFR 3165.4(c). Copies of the notice of appeal and petition for a stay must also be submitted to the Interior Board of Land Appeals and to the appropriate office of the Solicitor at the same time the original documents are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.
The Bureau of Reclamation (Reclamation) adopts the Draft (DES 95-15) and Final (FES 95-24) Environmental Impact Statements (hereafter referred to as the EIS) for the Fontenelle Natural Gas Infill Drilling Projects prepared by the Bureau of Land Management (BLM). Reclamation has performed an independent review of the EIS and finds that it adequately addresses resource issues, alternatives, impacts and mitigation relevant to withdrawn and acquired lands in Reclamation’s Seedskadee Project within the project area described in the EIS. The scope of this Record of Decision specifically applies to those Reclamation actions and activities that will be required as a result of future implementation of the Fontenelle Natural Gas Infill Drilling Projects.

Reclamation participated in the preparation of the EIS as a cooperating agency (as defined at 40 CFR 1501.6) and provided expertise and input relevant to potential impacts and mitigation on Reclamation-withdrawn and acquired lands. Reclamation will not recirculate the EIS because it participated in the development, analyses, public involvement and distribution of the document.

Reclamation finds that the BLM’s selected alternative (the Resource Protection Alternative) is consistent with the March 25, 1983, Interagency Agreement between BLM and Reclamation for management of Reclamation-withdrawn and acquired lands. The Interagency Agreement states that the BLM, in consultation with Reclamation, shall develop special stipulations, consistent with statutory authority, and terms and conditions, as may be determined necessary by Reclamation, to protect the Reclamation-withdrawn and acquired land for Reclamation purposes. The EIS and the BLM Record of Decision, with Appendices A-G, contains those special stipulations, terms and conditions that will protect Reclamation-withdrawn and acquired lands for Reclamation purposes. Reclamation incorporates the BLM Record of Decision and Appendices A-G by reference. Reclamation and BLM will, in accordance with the Interagency Agreement, implement those stipulations, terms and conditions that apply to Reclamation-withdrawn and acquired lands.

Management of mineral resources will be consistent with BLM authorities and includes oil and gas resources. The BLM Record of Decision provides for further site-specific environmental analysis, assessment and documentation, when needed, before authorization of individual actions.

Charles A. Calhoun
Regional Director
Upper Colorado Region
Bureau of Reclamation
APPENDIX A
ENVIRONMENTAL STANDARDS, PROCEDURES, AND REQUIREMENTS FOR IMPLEMENTATION OF THE FONTENELLE NATURAL GAS INFILL DRILLING PROJECTS [DALEN and Lincoln Road Project Areas]
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ENVIRONMENTAL STANDARDS, PROCEDURES AND REQUIREMENTS FOR IMPLEMENTATION OF THE FONTENELLE NATURAL GAS INFILL DRILLING PROJECTS [DALEN and Lincoln Road Project Areas]

The standards, procedures, and requirements described in this Appendix are taken from BLM State and District planning standards, Bureau of Reclamation Regional standards, the Green River Resource Management Plan Final Environmental Impact Statement (BLM 1996), and the Fontenelle Infill Drilling Projects EIS. Permit applications refer to Applications For Permits to Drill (APDs), Summary Notices (SNs), applications for Rights-of-Way (ROWS), and other required BLM applications.

The Fontenelle Projects Operators will comply with the standards, procedures, and requirements contained in Appendix A, unless otherwise provided for by the Authorized Officer. Failure to comply with these terms and conditions will constitute a violation of the written order of the Authorized Officer and subject the proponent to penalties provided for under the law.

Appendix A is divided into seven sections as follows:

Section I: Pre-Authorization/Administrative Requirements
Section II: Standard Pre-Construction Planning and Design Considerations For Surface-Disturbance Activities
Section III: Standard Construction Procedures For Surface-Disturbance Activities
Section IV: Operator-Committed Construction, Operation, and Reclamation Practices and Applicable EIS Mitigation
Section V: Procedures For Processing Applications in Areas of Seasonal Restriction
Section VI: Methods of Protection of Groundwater During Drilling and Abandonment Operations
Section VII: Materials Utilized in Fontenelle Projects which May Contain Potentially Hazardous Substances

SECTION I: PRE-AUTHORIZATION/ADMINISTRATIVE REQUIREMENTS

1. The Operators and/or their contractors and subcontractors will conduct all phases of project implementation, including well location, road and pipeline construction, drilling and completion operations, maintenance, reclamation, and abandonment in full compliance with all applicable federal, state, and local laws and regulations and within the guidelines specified in approved APDs, ROW permits, and site-specific EAs and Decision Records (i.e., individual well location, road, pipeline, and ancillary facility EAs). Lessees and operators shall be held fully accountable for their contractor’s and subcontractor’s compliance with the requirements of the approved permit and/or plan (Onshore Order No. 1).

2. Drilling of Federal minerals is subject to BLM Onshore Oil and Gas Order No. 1 (43 CFR 3164). The operators’ drilling programs require BLM approval for each new well on public lands prior to the commencement of drilling. Federal review of the drilling program will be accomplished through the Application for Permit to Drill (APD) process. BLM Onshore Order No. 1 requires an applicant to comply with the following requirements:
   a. Operations must result in the diligent development and efficient recovery of resources;
   b. All activities must comply with applicable Federal laws and regulations and with State and local laws and regulations to the extent that such State and local laws are applicable to Federal leases;
   c. All activities must contain adequate safeguards to protect the environment;
   d. Disturbed lands must be properly reclaimed;
   e. All disturbances to the environment must be repaired;
   f. All drilling operations must be conducted in a manner to protect the environment;
   g. All drilling operations must conform to Federal, State, and local laws and regulations;
   h. All drilling operations must comply with all applicable Federal, State, and local laws and regulations;
   i. All drilling operations must comply with all applicable Federal, State, and local laws and regulations.

Table 3-1

<table>
<thead>
<tr>
<th>Issuing Agency/Permit Name</th>
<th>Nature of Permit/Approval</th>
<th>Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bureau of Land Management Approval to Dispose of Produced Water</td>
<td>Controls disposal of produced water from Federal leases</td>
<td>Mineral Leasing Act of 1920 (30 U.S.C. 181 et seq.); 43 CFR 3164; Onshore Oil and Gas Order No. 7</td>
</tr>
<tr>
<td>Bureau of Reclamation Cooperating Agency</td>
<td>Issuance of easements and rights-of-way on Reclamation lands; Review of EIS</td>
<td>National Environmental Policy Act</td>
</tr>
<tr>
<td>U.S. Army Corps of Engineers Section 404 Permit (Nationwide or Individual)</td>
<td>Controls placements of dredged or fill material in waters of the United States and adjacent wetlands</td>
<td>Section 404 of the Clean Water Act of 1972 (40 CFR 122 - 123)</td>
</tr>
<tr>
<td>Wyoming Department of Environmental Quality-Water Quality Division Notice of Intent Storm Water Discharge Permit</td>
<td>Controls off-site storm water runoff from construction activities resulting in 5 acres or more of disturbance. A field-wide permit issued for &gt; 20 wells.</td>
<td>Section 403 of the Clean Water Act (40 CFR Parts 122, 123, and 124); WDEQ Rues and Regulations, Chapter 18</td>
</tr>
<tr>
<td>Wyoming Department of Environmental Quality-Air Quality Division</td>
<td>Compliance sites, flaring, and other natural gas production and processing facilities</td>
<td>Section 22 of the Wyoming Air Quality Standards and Regulations</td>
</tr>
<tr>
<td>Wyoming Department of Transportation Overruns and Overlength Load Permits</td>
<td>Permits for oversize, overlength, and overweight loads</td>
<td>Chapters 17 and 20 of the Wyoming Department of Transportation Rules and Regulations</td>
</tr>
<tr>
<td>Wyoming Oil and Gas Conservation Commission Permit to Drill, Deepen or Plug Back (APD process)</td>
<td>Controls drilling of all oil and gas wells in the State</td>
<td>Wyoming Oil and Gas Conservation Commission Regulations (Section III, Rule 301)</td>
</tr>
<tr>
<td>Wyoming Oil and Gas Conservation Commission Application for Permit to Use Earthen Pit</td>
<td>Regulates reserve pit on drilling locations</td>
<td>Wyoming Oil and Gas Conservation Commission Regulations (Section III, Rule 336)</td>
</tr>
<tr>
<td>Wyoming Oil and Gas Conservation Commission Plugging and Abandonment of a Well</td>
<td>Establishes procedures for permanently abandoning a well</td>
<td>Wyoming Oil and Gas Conservation Commission Regulations (Section III, Rule 313)</td>
</tr>
</tbody>
</table>

A-1-1

Table 3-1

Federal, State and Local Permits, Approvals and Authorizing Actions Necessary for Construction, Operation, Maintenance and Abandonment of DALEN and the Lincoln Road Operators' Proposed Actions and the Resource Protection Alternatives
o Underground sources of fresh water must be protected from fluid injection operations; and
o All activities must protect public health and safety.

3. The standard operating procedures for surface-disturbing activities must be adhered to during all proposed activities unless the Authorized Officer (AO)-approved written exception has been granted. Exceptions would only be granted in cases where adherence to standard procedures is not possible or necessary, and the project is acceptable with proper mitigation.

4. In accordance with BLM regulation 43 CFR 3162.1(a) and Onshore Orders, the Operators will be responsible for the compliance of their employees, contractors, and subcontractors with the terms and conditions of all permits, agreements, and mitigation measures described in this Record of Decision. Each contractor and subcontractor will be required to maintain up-to-date plans and specifications at construction sites.

5. The Operators will keep livestock operators and land owners informed, as necessary, of construction activities. During construction, Operators will require their contractors to register access and vehicular traffic as necessary to protect the public and livestock from hazards associated with construction. The Operators will implement the mitigation measures developed in conjunction with the Fish and Wildlife Natural Gas Infill Drilling Projects EIS and brought forward into the ROD and this Appendix.

6. The Operators will comply with existing federal, state, and county requirements and restrictions developed to protect road networks and the traveling public. Special arrangements will be made with the Wyoming Highway Department, as required, to transport oversize loads to the EIS area. Otherwise, load limits will be observed at all times to prevent damage to existing road surfaces.

AUTHORIZATION TO PROCEED

7. The BLM Green River Resource Area Manager or his designee is the Authorized Officer (AO) for project surface and subsurface activities on BLM and Reclamation administered lands.

8. Mitigation and monitoring measures identified in this chapter may be modified by either AO based on new information or to further minimize impacts. Interdisciplinary team recommendations will be developed during field on-site analyses, conducted during APD and ROW reviews, and presented to the AO. Final mitigation and monitoring requirements will be determined by the AO.

9. Implementation of the Operators' projects on public lands will be contingent upon BLM receiving, for approval/acceptance, the following plans for each Operator's leased or project area:

- Plan of Development: Spill Prevention Control Countermeasures Plan (SPCC); Stormwater Pollution Prevention Plan (SPPPP); Erosion Control, Revegetation, and Restoration Plan (ERRP), Appendix D; Transportation Plan; Reclamation Plan; Wildlife Mitigation Plan; Monitoring Plan; and Site-specific APD plans/reports (e.g., road and well pad design plans, cultural clearance, special status plant species clearance, etc.).

The above plans may be prepared by each Operator for their specific project area or developed by each Operator and submitted incrementally with each APD, ROW application, or Sundry Notice.

10. An interdisciplinary team of appropriate resource specialists will conduct on-site environmental reviews for each APD to identify final well locations, access road alignments, and pipeline routes. To facilitate this process, the on-site visit should occur as early as possible and before any Operator surveying has occurred. This requires all those attending the on-site be thoroughly prepared and knowledgeable so that decisions can be made on-site. This will serve the best interests of all involved through early identification of significant issues, minimize revisions, and reduce or eliminate the need for additional site visits.

11. Approval of individual project components (i.e., wells, roads, pipelines, and ancillary facilities) for the project areas will be contingent upon completion of a site-specific cultural resource file search and Class III cultural clearance, and, as necessary, paleontological clearance, T&E and candidate species surveys, sage grouselek clearance, or other clearance as specified by the AO.

12. The AO will consult with other agency personnel (e.g., Reclamation, WGFID, FWS), on a case-by-case basis, regarding well location construction, drilling, completion, and production facility installation when sensitive resource values (e.g., wildlife, visual, etc.) are involved. This consultation will be to determine whether project activities should proceed in areas and/or during periods of seasonal restriction. Exceptions will be granted only in cases where adherence to lease and/or unit area stipulations is not necessary. The Operators will be encouraged to submit APDs and ROW applications for development activities on critical winter ranges such that there is sufficient time to complete all activities prior to critical winter periods. Section V of this Appendix provides procedures that will be followed in processing applications in areas of seasonal restriction.

13. Operators will include in their APD, ROW, or other appropriate permit application, discussion of and a map showing specific locations where site-specific mitigation and environmental protection measures called for in this Appendix will be implemented. Final locations for these measures will be confirmed by BLM and the Operator following on-site inspections of project locations. Individual APDs, ROWs, or permit applications would also address well site and access road drainage systems, segregation of topsoil and spoil materials, surface manipulations, waste disposal, soil treatments, recontouring and reclamation. An estimated time for commencement and completion of reclamation operations should also be included. Section III provides standard construction procedures for surface disturbance activities.

14. Proposed surface disturbance activity (e.g., construction activities such as roads, well locations, pipelines, etc.) will be accompanied by appropriate engineering design, geotechnical analyses (if necessary), mitigation plans, etc. This information will be of sufficient detail to demonstrate that all environmental resources will be adequately protected or that impacts to them will be adequately mitigated.

The following areas or situations will require more detailed or complex designs, plans or analyses:

- slopes in excess of 25%;
- areas within 500 feet of surface water and/or wetland areas;
- areas within 100 feet of ephemeral/intermittent drainages;
- areas on unstable soils;
- construction on frozen material or during periods when solid material is saturated or when watered down damage is likely to occur;
construction activities in crucial wildlife habitats (e.g., crucial winter ranges); or
construction at sites where cultural or paleontological resources are present.

All sources of aggregate for construction materials necessary for well locations, road construction, road improvement, and maintenance will be identified by the Operators. The appropriate surface management agency (BLM or Reclamation) must approve the sources and times of extraction.

15. The APD or permit application will include maps and diagrams showing the following information, as applicable:

- Pipeline alignments relative to existing and proposed roads;
- Well pad locations relative to existing pads and roads;
- Well pad designs;
- Roads that will be used to access the project area;
- Road designs construction specifications;
- Any temporary use areas or road pullouts;
- Areas with special terrain conditions (e.g., steep slopes);
- Other areas with special conditions such as proximity to drainages, cultural resources, or petrified wood area;
- Specific locations where mitigation measures would be implemented (e.g., marshing, waterbars);
- Crossings of intermittent drainages;
- Areas of grading and striped vegetation;
- Topsoil stockpiles;
- Sediment control measures; and,
- Location of crucial winter ranges, leks, and other resources which could result in seasonal constraints on proposed activities.

16. EO 11988 requires the BLM to restore and preserve the natural and beneficial values of floodplains in all activities conducted by the agency which affect land use, including regulating and licensing activities. If construction would occur in a floodplain, alternatives to avoid adverse effects and incompatible development in the floodplain will be evaluated. If the BLM determines that the only practicable alternative requires sitting in a floodplain, the Operator and the BLM will design or modify the project to minimize the potential harm to or within the floodplain.

17. EO 11990 requires BLM, to the extent possible, to avoid destruction or modification of wetlands and to avoid new construction in wetlands wherever there is a practicable alternative. To the extent permitted by law, the BLM is prohibited from undertaking or providing assistance for new construction located in wetlands unless the agency finds: 1) that there is no practicable alternative to the construction; and 2) that the action includes all practicable measures to minimize harm to the wetland.

18. State of Wyoming Permits. Numerous permits are required from the State of Wyoming before the companies can proceed with project implementation (see Table 1-1). State permits which parallel those of the federal agencies include the following:

a. Storm Water Regulations, Section 402(p) of the Clean Water Act, require the regulation of all storm water discharges under the National Pollutant Discharge Elimination System (NPDES) program. Best management practices (BMP) must be applied to control off-site sedimentation from construction activities designed to prevent off-site sedimentation movement and erosion by protecting soils. The practices are to be designed to remove sediment from runoff before the runoff is discharged from the site (August 16, 1991, EPA draft regulations). The WDEQ is responsible for enforcing the Federal storm water pollution prevention regulations. The State requires a general permit for storm water discharges associated with "industrial discharges where five or more surface acres are disturbed." Operators must prepare a storm water pollution prevention plan as described in the Notice of Intent for Coverage Under WDEQ General Storm Water Permit for Construction Activities (WDEQ guidelines). The operator submits a Notice of Intent to WDEQ. The agency reviews the Notice of Intent and the operator notification that coverage under the general permit has been granted. The operator is obligated to implement the pollution prevention plan and to perform inspections of the pollution control structures and activities weekly and whenever a storm event of 0.5 inches of precipitation or snowfall occurs. Copies of the plan and inspection reports are to be retained in the field but do not have to be submitted to WDEQ unless specified to do so.

b. The Wyoming Department of Transportation. Transport of oversize, overweight or overload loads (particularly digging rigs) require transport permits from the State (for State and Federal highways).

c. Wyoming Oil and Gas Conservation Commission. In addition to the Federal APD review process, DALEN and the Lincoln Road Operators must also secure approval to drill the infill wells from the Wyoming Oil and Gas Conservation Commission (WOGCC) pursuant to W.S. 30-5-101 et seq. This permit requirement applies to all lands within the State including Federal-managed lands (WOGCC Rule No. 205). The permitting process and information requirements are similar to the Federal APD process.

d. Protecting Public Safety. The WOGCC has adopted minimum safety standards for oil and gas activities (Rules 320-A, 327 and 328). BLM enforces similar safety regulations. The RPA must comply with these regulations. The regulations apply to general fire prevention, public protection, well operations, drilling, well servicing, production and associated facilities. WOGCC and BLM inspectors periodically inspect operations to assure compliance.

e. General Drilling Rules. Similar to BLM's Onshore Order No. 2, the WOGCC has adopted rules to protect domestic fresh water. The WOGCC requires surface casing to a depth below all known or reasonably estimated usable domestic fresh water levels (Rule 320(a)). Surface casing must be installed and cemented with sufficient cement to fill the annulus to the top of the hole. Rule 326 addresses pollution and surface disturbance. The regulation states that owners "shall not pollute streams, underground water or unreasonably damage the surface of the leased premises or other lands."

f. The Wyoming Oil & Gas Conservation Commission (WOGCC). The WOGCC permits and regulates the construction of pits located on-site. The agency prohibits the discharge or escape of fluid contents of any pit without an NPDES permit.

g. Wyoming Department of Environmental Quality (WDEQ). The WDEQ-Water Quality Division (WQD) issues permits for and regulates off-site commercial disposal of fluids. If drilling fluids are hauled off-site for disposal at a commercial disposal facility, a permit will be required from WDEQ-WQD.

h. WDEQ-Air Quality Division (AQD). The WDEQ-AQD requires air quality permits which would examine expected emissions from specific project components (such as compressors) prior to 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.

i. Wyoming State Engineer's Office (WSE). The WSE issues permits allocating water take-out from rivers, streams, or groundwater.

19. Local Permits. Lincoln County has adopted a comprehensive plan and has an oil and gas permit system. The County is not zoned and the County deals with every application as a Conditional Use Permit. All wells will require an oil and gas location permit which requires the applicant to submit to the County copies of permits (e.g., APDs) received from the BLM and other agencies. Sweetwater County requires all oil and gas companies to obtain the proper permits and zone changes from the County Land Use Office before drilling, construction and associated activities are initiated.
 SECTION II: STANDARD PRE-CONSTRUCTION PLANNING AND DESIGN CONSIDERATIONS FOR SURFACE-DISTURBANCE ACTIVITIES

This Section describes the standard practices that must be considered when planning surface disturbing activities on BLM or Bureau of Reclamation lands to mitigate adverse effects caused by such activities. The listed standard practices are applied to the Fonnelle Projects Resource Protection Alternatives (RPAs).

II.1 GENERAL CONSIDERATIONS

1. Topography
   a. Unnecessary topographic alterations will be mitigated by avoiding, where possible, steep slopes, rugged topography, and perennial and ephemeral/inintermittent drainage systems, and by minimizing the area disturbed.

2. Transportation Plan (Also see Sections III, IV.1, B, and IV.2-B)
   a. Guidelines for access road location, design, and resource protection considerations are contained in the Road Development Plan (Appendix C). The road development plan provides guidelines on how transportation planning should occur. A transportation plan is the beginning of the road planning process. It deals with road layout in relation to resource issues; it pre-defines road network the company wants to service their field. it is a conceptual thought process and interpretation of the collector and local road system, coordinated with existing landowner/s, to ensure compatibility; it addresses the obvious part of the net of roads; it is incremental in its development.
   b. The transportation plan will include, to the extent necessary and practicable, a summary of: existing and new roads which will be used to access the development area and well locations; roads which will be closed to project-related traffic; roads and trails within the development area which will be reclaimed; the road standard/s which will apply to proposed roads or road upgrades; and soil conditions and type of surfacing (e.g., depth of gravel) to be applied to new and existing roads. The plan will be updated incrementally as development occurs.
   c. Individual road design plans for new and/or improved roads will be submitted for approval as components of APDs or ROW permits. All new and improved roads will adhere to BLM road design and construction guidelines, and plans must be approved prior to initiation of work. Operators will schedule a review of plans with sufficient time to obtain BLM approval prior to commencement of work.
   d. Operators will be responsible for necessary preventative and corrective road and bridge maintenance for the duration of the project. Maintenance responsibilities may include, but are not limited to, mowing, gravel surfacing, cleaning ditches and drainage facilities, dust abatement, noise, and control, bridge inspection and repair, or other requirements as directed by the AO.

3. Drill Site Design Plans (Also see Sections III, IV.1-C, and IV.2)
   In conformance with Onshore Oil and Gas Order No. 1, Operators will prepare and submit individual comprehensive drill site design plans for BLM approval. These plans will show the drill location layout over the existing topography, dimension of the location, volumes and cross sections of cut and fill, location and dimensions of reserve pits, existing drainage patterns, and access road ingress and egress. Plans shall be submitted and approved prior to initiation of construction.

4. Hazardous Material Containment (Also see Section IV.2-F)
   a. All storage batteries constructed as components of the project, including deep hulls or sludge holding at compressor facilities, will be surrounded by a containment dike of sufficient capacity to contain the entire storage capacity of the largest facility plus one foot of freeboard. Notice of any spill or leakage, as defined in BLM NTI 3A, will be immediately given by the Operator to the AO and other such federal and state officials (e.g., WDEQ) as required by law. Any oral notice shall be given as soon as possible, but within 24 hours, and oral notices shall be confirmed in writing within 72 hours of any such occurrence.
   b. All project activities shall be in compliance with local, state and federal regulations and accepted practices, and the Operators' Spill Prevention Control and Countermeasure Plan.

5. Stormwater Pollution Prevention Plan/Erosion Control, Restoration, and Revegetation Plan(s) (Also see Sections III and IV.2-L)
   a. The Operators will prepare a Stormwater Pollution Prevention Plan (SPPP) for their developments as required by the WDEQ-WQD. This plan will identify best-management practices, including erosion and pollution control practices that will be implemented throughout the field for the life of the project to minimize pollution of surface waters. The SPPP is synonymous with the intent of the BLM's erosion control, revegetation, and restoration plan (ERRP).
   b. Prior to construction, Operators will submit a site-specific ERRP for each APD or ROW (well location, road, and/or pipeline) (see Appendix G for ERRP outline). Potential species for use in reclamation of disturbed areas are listed in Section III, Table III-3, 4, & 5. Reclamation plans will be provided as components of applications for APDs and ROWs according to guidelines established in Section IV.2-L, 1, 2, & 3). These reclamation plans will detail all practices necessary for reclamation in areas not required for production operations (e.g., unused portions of well locations, portions of road ROWs, and entire pipeline ROWs outside road ROWs, etc.). Plans will include re-configuration to blend in with surrounding topography and drainage systems, segregation of topsoil and spoil materials, surface manipulations, waste disposal practices, soil treatments, and species lists and will incorporate as applicable, specific reclamation procedures presented in this document. An estimate of the time for commencement and completion of reclamation operations will also be included. Similar reclamation plans will be prepared upon abandonment of production facilities.

6. Geologic Hazards (Also see Section IV.2-K & L)
   a. Wells, pipelines, and ancillary facilities will be designed and constructed such that moderate earthquakes will not damage these features. The probability of a severe earthquake occurring during the life of the project is unlikely.
   b. Any facilities defined as critical according to the Uniform Building Code will be constructed in accordance with applicable Uniform Building Code Standards for Seismic Risk Zone 2B.
   c. Activities within potential landslide areas or on slopes greater than 25% will be avoided where possible. Unavoidable disturbance of these areas will be reviewed on a site-specific basis by the BLM during the APD and/or ROW application processes.
   d. To mitigate potential impacts caused by flooding during the life of the project, construction in flood-prone areas will be limited to late summer, fall, or winter when conditions are generally dry and streamflows are low. Additional mitigation to lessen any impacts from flooding or high flows during and after construction will include the avoidance of areas with high erosion potential (i.e., steep slopes, floodplains, unstable soils); reestablishment of existing contours when possible; avoidance of areas within 500 feet of the edge of riparian areas, where possible; and implementation of appropriate erosion and sediment control and revegetation procedures as identified in WDEQ-WQD SPPP/BLM ERRPs.
   d. To prevent reactivation of stabilized dunes, these areas will be avoided where possible, and areas necessarily disturbed will be seeded by the next appropriate seeds after disturbance. If deemed appropriate by the BLM AO, disturbed areas will be mulched or otherwise protected to prevent wind erosion and facilitate plant establishment.

II.2 RESOURCE-SPECIFIC MITIGATION

1. Air Quality (Also see Sections III and IV.2-G)
   a. Regular equipment maintenance, including emissions checks, and regular maintenance of roads will reduce impacts to air quality. Impacts to air quality due to airborne dust from roads will be minimized by surfacing, application of water, or other suitable chemicals, and maintaining a 1 to 30 mph speed limit. Roads and roadbeds will be constructed with appropriate materials (gravel) to minimize dust generation. No open burning of garbage or refuse will be allowed at the well sites or other facilities.
   b. Necessary air quality permits to construct, test, and operate facilities will be obtained from the WDEQ-AQD. The BLM will encourage Operators to optimize total construction or the amount of construction at any one time to reduce generation of

A-2-II
fugitive dust, and will require utilization of watering and other applicable techniques to reduce fugitive dust generation. All internal combustion equipment will be kept in good working order.

2. Soils (Also see Sections III and IV.2-L)

a. Adverse impacts to soils will be mitigated by minimizing disturbance, avoiding construction with frozen soil materials; avoiding areas with high erosion potential (e.g., unstable soils, dunal areas, slopes greater than 25%, floodplains), where possible; salvaging and selectively handpiling topsoil from disturbed areas; adequately protecting stockpiled topsoil using temporary vegetation cover or other appropriate means and replacing it on the surface during reclamation; leaving the soil intact (scaping only) during pipeline construction, where possible; using appropriate erosion control and sedimentation control techniques including, but not limited to, diversion terraces, riprap, and matting; and promptly revegetating disturbed areas using adapted species. Temporary erosion control measures such as temporary vegetation cover; application of mulch, setting, or soil stabilizers; and/or construction of barriers may be used in some areas to minimize wind and water erosion and sedimentation prior to vegetation establishment. Specific measures and locations will be specified in the APD and/or ROW application processes.

b. Where feasible, and where disturbance is minimized, pipeline ROW's will be located adjacent to roads avoiding creation separate areas of disturbance.

c. Appropriate erosion control and revegetation measures will be employed. Grading and landscaping will be done so that all construction equipment will be installed on disturbed slopes with grades of 6% or greater and may be installed on disturbed slopes with grades of less than 6% in areas with unstable soils where seeding alone will not adequately control erosion. Erosion control efforts will be monitored by BLM and the Operators and augmented as necessary to control erosion. BLM will conduct quality assurance reviews to ensure compliance with approved mitigation.

d. Sufficient topsoil or other suitable material to facilitate revegetation will be segregated from subsoils during all construction operations requiring excavation and will be returned to the surface upon completion of operations. Topsoil stockpiles in place six months or more will be revegetated or otherwise protected to prevent erosion and maintain some soil microflora and microflora. Soils compacted during construction will be ripped and tilled as necessary prior to reseeding. Cut and fill sections on all roads and along pipelines will be protected from contamination by a pipeline break with shutoff valves or other systems capable of minimizing accidental discharge.

e. Any accidental soil contamination by spills of petroleum products or other hazardous materials will be cleaned up and the soil disposed of or rehabilitated as specified in the Operators' SPCC Plan.

3. Water Resources (Also see Sections III, IV.2-I and 1, and Appendix VI)

a. Surface Water - Operators will avoid disturbance in the vicinity of streams by avoiding impacts within 500 feet of wetlands/riparian areas, where possible. In the event that streams will be crossed, culverts will be installed at all appropriate locations as specified in the Manual '912-Bridges and Major Culverts and Manual 9113-Roads, streams will be crossed perpendicular to flow, where possible, and all stream crossing structures will be designed to carry the 25-year discharge event or other capacities as directed by the BLM.

b. Staging areas for water take-out from rivers, streams, lakes or ponds may be located at least 50 feet from stream banks where topographic conditions permit. An SPCC plan is required for potential contamination of surface water by spills of fuels, oil, or other hazardous materials during motor survivng or refueling. Portable/free-standing pumps will be located within a containment device to eliminate spill into water. Storage of hazardous materials, within 100 feet of all surface waters is prohibited. A water use permit will be obtained from the Wyoming State Engineers Office. A ROW will be obtained from the appropriate landowner for access and staging.

c. Operators will ensure that state and federal water quality standards will not be exceeded through appropriate disposal of produced water as directed by the WOGCC and BLM and the prudent use of erosion control measures and timely revegetation of disturbed areas. Any disposal of produced water will be approved by the BLM and/or WDEQ.

d. Guidelines specified in the Operators' SPCC Plans will be adhered to such that any spill or accidental discharge of a hazardous material will be remediated. An orientation should be conducted by the Operator to ensure that the worker/contractor personnel are aware of the potential impacts that can result from accidental spills, and that they know the appropriate recourse in the event that a spill occurs. Spills will be protected from contamination by a pipeline break with shutoff valves or other systems capable of minimizing accidental discharge.

e. Erosion-prone or high-salinity areas will be avoided where possible, and necessary construction in these areas will be done in the late summer, fall, and winter to avoid peak runoff periods. Proper containment of oil and produced water in the tanks, drilling fluids in reserve pits, and the location of staging areas for storage of equipment away from drainage areas to prevent contaminants from entering surface waters.

f. Prudent use of erosion control measures including diversion terraces, riprap, matting, temporary sediment traps, and water bars will be employed as necessary. Interceptor dikes will be used to control surface runoff generated at well locations, and dike location and construction methods will be described in drill site design plans. If necessary to reduce suspended sediment loads and remove potential contaminants, operators will treat diverted water in detention ponds prior to release to undisturbed areas with dense vegetation away from all drainages. Additional water will be discharged onto undisturbed vegetated land or into an established drainage. Prior to discharge, water will be treated or filtered if necessary to reduce contaminant levels and/or reduce suspended particulates to meet applicable state or federal standards. If water is discharged into an established drainage channel, the rate of discharge will not exceed the capacity of the channel to convert the increased flow. Waters that do not meet applicable state or federal standards will be evaporated, treated, or disposed of at an approved disposal facility.

g. Groundwater - Operators will construct reserve pits in cut areas in or compacted and stabilized fill. Subsoil material stability and permeability in the area of construction will be evaluated and the need for pit reinforcement assessed. The subsoil material of the pit to be constructed will be inspected to assure 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 usable groundwater, soil type and permeability, and after evaluation of the fluids which would likely be retained in the pit.

h. All reserve pits will be lined unless demonstrated they do not need to be lined based on site-specific conditions during the APD approval process. Bentonite or synthetic impermeable liners that meet specific competency standards will be used.

i. Consideration should be given to use of closed or semi-closed drilling systems in situations where a liner may be required. When reserve pit fluids contain oil, toxic substances, or other contaminants, Operators will employ approved on-site methods of disposal or permanent off-site disposal in accordance with WDEQ regulations. A liner will be required in shallow water table areas; groundwater recharge areas; areas with drill sites within 500 feet of stream channels, seeps, springs, streams internally drained lakes; and/or where reserve pits are constructed in earthfill (as opposed to cut).

j. If lining is required, the pit liner permeability will be less than 10⁻⁶ cm/sec and have a burst strength equal to or exceeding 300 pounds per square inch (psi), a puncture strength of 160 psi or greater and grab tensile strength of 150 psi or greater. The liner will be resistant to deterioration by hydrocarbons. Liners will not be installed directly on rock. Where necessary, pits will first receive a layer of bedding material (e.g., sand or geotextile (fiber liner) sufficient to prevent contact between the liner and any exposed rock. The pad will be designed so that runoff from adjacent slopes does not flow into the reserve pit.

k. Reserve pits will be reclaimed using the methods approved by the AO in accordance with Onshore Order No. 7. Reservoirs will use acceptable methods that remove pit liquids through evaporation, solidification, or disposal at WDEQ-WQD approved and permitted facilities.

l. All wells will be cased and cemented to protect accessible freshwater zones (see Section VI). Unproductive wells and wells that have completed their intended purpose will be properly abandoned and plugged using procedures identified by the Office of State Oil and Gas Supervisor Rules and Regulations of WOGCC, and the BLM.

m. Produced Water and Hydrostatic Pipeline Testing - Disposal of produced water and water used for testing that does not meet applicable state or federal surface water or groundwater standards will not be
reduced on the ground surface. This water will be treated in a lined treatment pond prior to discharge or transported away from wet locations to an approved facility for disposal. All discharge of hydrostatic water will be coordinated with WDEQ-WQD and the BLM.

4. Noise

Noise mitigation will be applied at well locations, as determined necessary on a case-by-case basis by the BLM. All engines required for project activities will be properly muffled and maintained. Construction, drilling, completion, testing, and production facility installation activities will be seasonally restricted on crucial big game ranges during critical winter periods, proximal to active raptor nests during the nesting period, and in sage grouse breeding areas unless exempted by the Oregon Territorial Vets. Use of road use and travel pattern specifications designed to keep traffic to a minimum to reduce noise impacts will be identified in the Transportation Plan.

5. Vegetation (Also see Section III)

a. Removal and disturbance of vegetation will be kept to a minimum through construction site management (e.g., using previously disturbed areas and existing easements, limiting equipment/materials storage yards and staging areas, etc.). Well locations and associated roads and pipelines will be located to avoid and/or minimize impacts in areas of high value (e.g., sensitive plant habitats, wetlands, riparian areas). Vegetation scarping and/or vegetation/topsoil removal will not occur over the trench will be employed during pipeline construction, where possible.

b. Proper erosion and sediment control structures and techniques will be incorporated by Operators into the design of well pads, roads, pipelines, and other facilities (Appendix G). Revegetation using the BLM-specified locally adapted seed mixture in Section III, Table III-3, 4, and 5 containing native grasses, forbs, and shrubs will begin in the first appropriate season following disturbance. Vegetation removed will be replaced with plants of equal value using procedures that include:

- fall reseeding (September 15 to freeze-up), where feasible;
- spring reseeding (prior to April 15) if fall seeding not feasible;
- deep ripping of compacted soils prior to reseeding;
- surface pitting/roughening prior to reseeding;
- utilization of native cool season grasses, forbs, and shrubs in the seed mix;
- interseeding of shrubs into an established stand of grasses and forbs at least one year after seeding the grasses and forbs;
- appropriate, approved weed control techniques;
- broadcast or drill seeding depending on site conditions;
- fencing of certain sensitive vegetation sites (e.g., riparian areas, steep slopes) as determined necessary through monitoring.

c. Recontouring and seedbed preparation will occur immediately prior to reseeding on the unused portion of well locations and road ROWs and entire pipeline ROWs outside of road ROWs. In the event of unmechanized wells, Operators will initiate reclamation of the entire location, access road, and adjacent disturbed habitats as soon as possible. Reclamation will be monitored by the Operators, in cooperation with BLM, annually or as specified in EERP to determine and ensure successful establishment of vegetation cover and productivity.

d. Operators will be responsible for implementation of a noxious weed control program in cooperation with the BLM and Sweetwater and Lincoln Counties to ensure noxious weed invasion does not become a problem. Weed-free certification by county extension agents will be required for grain, straw, or hay used for mulching revegetated areas.

6. Socioeconomics (Also see Section IV.2-A)

a. Operators will be encouraged to implement policies that use existing local labor.

b. Operators will be encouraged to schedule concentrations of project traffic, such as truck convoys or heavy traffic flows, to avoid periods of expected heavy traffic flows associated with recreation (e.g., opening day of prehogn season). Travel and parking will be restricted to access roads and on-site parking areas, respectively.

7. Land Use/Livestock Grazing Management (Also see Section IV.1-C, IV.2-C & M)

a. Reclamation of nonessential areas disturbed during construction activities will be accomplished in the first appropriate season after well completion. Nonessential areas include those portions of the well locations not needed for production operations, the borrow ditch and outsole portions of new road ROWs, entire pipeline ROWs on the outside of road ROWs, and all roads and associated disturbed areas at nonproductive well locations. Operators will repair or replace fences and cattleguards, gates, drift fences, and natural barriers to maintain current BLM standards. Cattleguards will be used instead of gates for livestock control on most road ROWs. Livestock will be protected from pipeline trenches, and livestock access to existing water sources will be maintained.

b. BLM, the Operator(s), and the livestock permittee will monitor livestock movements, especially regarding any impacts from roads or disturbance from construction and drilling activities. Appropriate measures would be taken to correct any adverse impacts that they occur.

c. All well locations, unauthorized roads, surface portions of pipelines, and ancillary facilities will be removed upon project completion.

d. Mitigation to prior rights include:

- limiting drilling operations to lands leased or owned by the Operators;
- locating wells away from known underground cables;
- regrading and repairing roads as necessary in areas damaged by project activities;
- reestablishing a level compacted surface where pipelines cross existing roads;
- advance identification and flagging of all existing ROWs that will be crossed by proposed pipelines and roads;
- backhoe and hand excavation at pipeline crossings until the exact locations of underground lines have been determined;
- restoring native vegetation as soon as practical.

8. Visual Resources (Also see Section IV.2-D)

a. With In Visual Resource Management (VRM) Class II and III areas, during on-site reviews, the BLM and the Operator will evaluate potential disturbances and impacts to visual resources and identify appropriate mitigation. New roads will be designed so that they conform with the landscape, incorporating curves to eliminate distant, straight line impacts; every opportunity will be taken to reclaim existing road ROWs that are not used when new roads are designed over them; revegetation will be initiated as soon as possible after disturbance; pipeline ROWs will be located within existing ROWs whenever possible; and aboveground facilities not requiring safety coloration will be painted with appropriate nonreflective standard environmental colors (Carlsbad Canyon or Desert Brown). Topographic screening, vegetation manipulation, project scheduling, and traffic control procedures will all be employed as deemed appropriate by the BLM to further reduce visual impacts.

b. Mitigation of impacts within Visual Resource Management Class II areas or to historic sites will include locating wells so as not to dominate views from selected viewing points, painting tanks and equipment such that they blend with the surrounding landscape, using topographic features to hide roads and facilities, and timely reclamation of surface disturbance.

9. Cultural and Historic Resources (Also see Section IV.2-E)

a. An existing data review has been completed for the entire project area. Class III surveys will be completed on all areas of proposed surface disturbance. If cultural resource surveys identify areas with a high probability of encountering potentially significant subsurface sites, a qualified archaeologist will visit those areas, or other appropriate measures to identify resource potentials prior to impacting buried cultural resources may be implemented following consultation with the Wyoming State Historical Preservation Office (SHPO). The Operators and their contractors will inform their employees about relevant federal regulations intended to protect cultural resources. Equipment operators will be informed that if a cultural site is uncovered during construction, activities in the vicinity will be halted and the BLM notified. An evaluation will be made by the AO, in consultation with SHPO, to determine appropriate actions to prevent the loss of potentially significant cultural resources. The Operator will be responsible for the cost of the evaluation, and any decision as to proper mitigation measures will be made by the AO after consulting the Operator. The Operator will be responsible for the costs of any mitigation for cultural resources. The program of the Oregon/Moran Pioneer National Historical Trails Management Plan (BLM 1996) will be followed for any actions affecting the historic trail.

b. Impacts to cultural resources will be mitigated following procedures as specified in 36 CFR 800.
Class III inventories will be conducted on all federal, state, and private lands affected by federal undertakings. Cultural resources identified during these inventories will be avoided, where possible. Areas adjacent to perennial waters and a diluent pool will also be avoided. Mitigation measures will be determined by the BLM in consultation with SHPO, the Advisory Council on Historic Preservation, and the Operator. If a large number of sites cannot be avoided, a programmatic agreement among the aforementioned parties may be developed.

All resources identified in Class III inventories will be evaluated for NRHP eligibility in consultation with the BLM and SHPO. If any NRHP (eligible or listed) site cannot be avoided, a data recovery plan will be implemented as directed by the BLM.

d. Historic trails will be avoided. Surface disturbing activities will avoid areas within 0.25 miles of a trail unless such disturbance will not be visible from the trail or will occur in an existing visual intrusion area. Historic trails will not be used as haul roads. Placement of facilities within view of the Oregon Trail will be avoided or special measures applied to blend facilities with in the background.

e. Any cultural resource (historic or prehistoric site or object) discovered by an Operator, or any person working on their behalf, will be immediately reported to the AO. Field personnel will be instructed not to disturb cultural resource sites or collect artifacts, and those caught disturbing cultural resources or collecting artifacts may be dismissed by the Operator and prosecuted by BLM.

f. If any area of religious or cultural importance to Native American groups is identified on public lands, the BLM will review the potential impacts on a site-specific basis to determine appropriate mitigation measures.

g. If any area of religious or cultural importance to Native American groups is identified on public lands, the BLM will review the potential impacts on a site-specific basis to determine appropriate mitigation measures.

10. Paleontological Resources (Also see Section IV.2-H)

a. If paleontological resources are uncovered after initiation of surface-disturbing activities, the Operator will suspend all operations that will further disturb such materials and immediately contact the AO, who will arrange for a determination of significance and, if necessary, recommend a recovery or avoidance plan. Mitigation of impacts to paleontological resources will be on a case-by-case basis. The Operator will be responsible for the costs.

b. Portions of the project area are considered to have high potential for paleontological resources. Development proposals in these areas will be reviewed for their potential to impact paleontological resources. However, a paleontological survey will not be required in all cases such as the presence of surficial materials (i.e., alluvium, sand dune, gravel, etc.), the amount of bedrock to be disturbed, and results of previous surveys will be considerations in determining the need for a survey. The need for mitigation (e.g., monitoring construction) will depend upon the results of the initial survey and the recommendations of the BLM. Paleontological surveys and monitoring will be conducted in accordance with BLM guidelines. The operator will be responsible for all associated costs.

c. In areas of high paleontological value where disturbance is proposed and a paleontological field survey has been determined necessary, the survey will be carried out by a qualified paleontologist. A report prepared in accordance with BLM Handbook 1701-1, Paleontological Resources on Public Lands: A Decision Makers Guide, will be prepared by the paleontologist and submitted to the BLM and to the operator. Field construction is necessary, a qualified paleontologist monitor will be required on site during construction activities. Costs associated with any needed paleontological mitigation measures shall be borne by the project proponent.

11. Special Status Plants (Also see Section IV.2-N)

A preliminary survey of the project area to determine the likelihood of the occurrence of special status plants and habitats was conducted for the Fortenelle Natural Gas Infill Development EIS. A map of potential habitat for special status plants will be prepared by BLM or other qualified botanist (authorized by BLM and subject to BLM's special status plant survey policy) prior to any surface disturbance to check for the presence of any known threatened, endangered, or special status plants, or potential habitat for such plants. If any such plant species or habitats are found, recommendations for avoidance will be made. If avoidance of a special status plant population is required, the authorized botanist will be present for monitoring during the construction phase of wellpads, pipelines, roads, and other project developments. If avoidance is not possible, consultation with USFWS will be initiated. Herbside applications on wellpads, pipelines, roads, and other project developments, where special status plants are known to occur, will be kept at least 100 feet from such special status plant populations or other distance deemed safe by the BLM botanist or AO.

12. Wildlife and Fisheries (Also see Section IV.2-O, V, and Appendix E)

a. Seasonal Restrictions - Table III-I lists seasonal restrictions for surface disturbance activities. Drilling and construction activities on big game critical winter and crucial winter/yearlong ranges will be curtailed during critical winter periods (i.e., November 15 through April 30). Operators will schedule drilling programs so that wells located within crucial ranges are constructed, drilled, and completed, and production facilities, including pipelines, are completed during, summer, spring, and fall. Exceptions to seasonal limitations in any year may be approved by the AO based on site-specific circumstances. Any exception is a one-time, case-by-case exemption from a lease stipulation or a permit condition of approval for a certain portion of a lease. The stipulation or condition of approval continues to apply to all other sites within the leasehold to which the restrictive criteria applies. See Appendix A, Section V for explanation of exception procedure.

b. Snowpiled Roads - During the winter, escape openings will be provided along access roads in big game critical ranges as designated by the BLM and WGF. A plan to facilitate exit of big game animals from snowpiled roads. To minimize displacement and stress of animals, Operators will instruct workers and contractors that they should avoid stopping and exiting their vehicles unnecessarily in big game winter habitat while there is snow on the ground.

c. Wildlife Mitigation Plan - The Operators, in consultation with representatives from BLM, BOR, WGF, FWS, and other interested groups such as area livestock owners, will prepare a wildlife mitigation plan for the Fortenelle projects area. The mitigation plan will be commensurate with the level of impact due to the natural gas development and operational activities. The mitigation plan will be developed, guided as a case study outlined in Appendix E of this ROD. The plan will be incorporated into each Operators' field operations manual or handbook, a copy of which will be kept on-site and in the office.

d. Reserve Pit Fencing - All reserve pits will be fenced to prevent big game and livestock access, and reserve pits will be backfilled when dry. If a reserve pit is identified as containing oil or toxic substances, reserve pit restoration will be begun immediately after cessation of drilling and testing activities, or the operator will be required to take appropriate steps to prevent migratory bird mortality (e.g., cover pits with netting), in compliance with BLM Informational Bulletin No. 97-WF-1. Reserves will be monitored for effectiveness by the BLM.

e. Vehicle/Wildlife Collisions - To minimize wildlife mortality due to vehicle collisions, Operators will advise project personnel regarding appropriate speed limits in the project areas, and roads will be reclaimed as soon as possible after they are no longer required. Some existing roads in the project areas may be closed and reclaimed as appropriate by the Operator as directed by the AO. In addition, project-required travel may be restricted to only that necessary for efficient project operation on roads located in big game critical ranges during critical winter months. Potential increases in poaching will be minimized through employee and contractor education regarding wildlife laws. If violations are discovered, the offending employee or contractor may be disciplined and/or dismissed by the Operator and prosecuted by the WGF.

f. Fisheries - Potential impacts to fisheries will be minimized by using proper erosion control techniques. Construction within 500 feet of open water and 100 feet of intermittant and ephemeral channels will be avoided.

g. Raptors and Sage Grouse - BLM and WGF surveys document raptor nests and sage grouse leks in the project area. Operators will comply with the following guidelines to avoid disturbance of raptor nests and sage grouse leks and nesting areas:
**Raptors**

- Well locations, pipelines, and associated roads will be selected and designed to avoid disturbances to areas of high wildlife value (e.g., raptor nest sites, wetland areas). In conjunction with the wildlife mitigation plan, Operators will include the design of a raptor mitigation program for the Frontenelle projects area in consultation with the BLM, BOR, FWS, and WFGFD.

- Raptor nest surveys will be conducted within a 0.5 to 1.0-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 (see Table II-1);

- **TABLE II-1**
  
<table>
<thead>
<tr>
<th>Affected Areas</th>
<th>Restriction</th>
<th>Restricted Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Big Game Crucial Winter Ranges</td>
<td>Nov. 15 - April 30</td>
<td>Antelope, elk, mule, and mule deer crucial winter ranges</td>
</tr>
<tr>
<td>Partition Areas</td>
<td>May 1 - June 30</td>
<td>Designated partition areas</td>
</tr>
<tr>
<td>Sage Grouse Lek and Nesting Areas</td>
<td>Feb. 1 - July 31</td>
<td>Up to 2-mile radius of lek</td>
</tr>
<tr>
<td>Golden Eagle Nest</td>
<td>Feb. 1 - July 31</td>
<td>Within one-half mile radius</td>
</tr>
<tr>
<td>Osprey Nest</td>
<td>Feb. 1 - July 31</td>
<td>Within one-half mile radius</td>
</tr>
<tr>
<td>Swainson’s Hawk Nest</td>
<td>Feb. 1 - July 31</td>
<td>Within one-half mile radius</td>
</tr>
<tr>
<td>Ferruginous Hawk Nest</td>
<td>Feb. 1 - July 31</td>
<td>Within one mile radius</td>
</tr>
<tr>
<td>Coopers Hawk Nest</td>
<td>Feb. 1 - July 31</td>
<td>Within one-half mile radius</td>
</tr>
<tr>
<td>Burrowing Owl Nest</td>
<td>Feb. 1 - July 31</td>
<td>Within one-half mile radius</td>
</tr>
<tr>
<td>Merlin Nest</td>
<td>Feb. 1 - July 31</td>
<td>Within one-half mile radius</td>
</tr>
<tr>
<td>Other Raptors</td>
<td>Feb. 1 - July 31</td>
<td>Within one-half mile radius</td>
</tr>
<tr>
<td>Game Fish Spawning Areas</td>
<td>Spring spawning</td>
<td>Determined on case-by-case basis</td>
</tr>
<tr>
<td></td>
<td>Fall spawning</td>
<td></td>
</tr>
</tbody>
</table>

- Permanent and high profile structures such as well pads, roads, buildings, storage tanks, overhead powerlines, etc., will not be allowed within 825 feet (0.25 km) of active raptor nests, with the exception of active eagle nests for which the distance will be 1,970 feet (0.60 km).

The buffer distance may vary depending upon the species involved, prey availability, natural topographic barriers, line-of-sight distances, and other conflicting issues such as cultural values, steep slopes, etc. Linear disturbances such as pipelines, seismic activity, etc., could be granted exceptions.

- **Sage Grouse**
  
  - Surface disturbance within 0.25 miles of a sage grouse lek will be avoided;
  
  - Permanent and high profile structures such as buildings, storage tanks, overhead powerlines, etc., will not be allowed 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 that will be adversely affected by surface disturbing activities is identified, surface uses and activities will be delayed in the affected area until nesting is complete;

- Field evaluations for sage grouse leks will be conducted by BLM or Operator qualified biologist prior to the start of activities in potential sage grouse habitat between February 1 and July 31. These field evaluations for leks will be conducted if project activities will occur in potential sage grouse habitat during the specified period. BLM wildlife biologists will ensure that such surveys are conducted using proper survey methods at the proper time of year.

13. **Wetlands/Riparian Areas** (Also see Section IV.2-K)

Operators will avoid disturbance of wetland and riparian areas by providing a 500-foot vegetation buffer between disturbances and wetland areas, where possible. Established crossings or temporary bridges will be utilized, and all staging areas will be placed away from wetland sites. Avoidance of wetland areas will be the primary objective. No new road crossings of perennial streams will be established. In cases where avoidance is not possible, special mitigation will be required. Compliance with Executive Orders 11988 (Floodplain Protection) and 11990 (Wetland Protection) will be assured through consultation with the Corps of Engineers (COE) and the associated Section 404 permitting process.

14. **Threatened, Endangered, and Candidate Wildlife Species** (Also see Section IV.2-N)

a. **Terrestrial Species** - Surveys for T&E and candidate wildlife species will be implemented in areas of potential habitat by qualified BLM biologist(s) or Operator and other right-of-way holder qualified biologist(s) prior to disturbance of proposed ROWs (e.g., access roads, pipelines) or APDs (well locations and associated access roads). Findings will be reviewed by BLM prior to or as components of the ROW application and APD review processes.

b. **Mountain Plover** - Mountain plover surveys will be made by BLM qualified biologist(s) or Operator and other right-of-way holder qualified biologist(s) in accordance with FWS guidelines provided in their letter of August 22, 1995. The survey procedures will include the following based upon the FWS guidelines:

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

- Surveys will be conducted no more than 14 days prior to the date actual ground disturbance activities begin. If two surveys are required, they will 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 the start-up date, as shown below:

<table>
<thead>
<tr>
<th>Date Placed Activity</th>
<th># Surveys Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 15 - April 15</td>
<td>1</td>
</tr>
<tr>
<td>April 15 - July 15</td>
<td>2</td>
</tr>
<tr>
<td>July 15 - August 15</td>
<td>3</td>
</tr>
</tbody>
</table>

- **Game Fish Spawning Areas**

- Operators will avoid disturbance of wetland and riparian areas by providing a 500-foot vegetation buffer between disturbances and wetland areas, where possible. Established crossings or temporary bridges will be utilized, and all staging areas will be placed away from wetland sites. Avoidance of wetland areas will be the primary objective. No new road crossings of perennial streams will be established. In cases where avoidance is not possible, special mitigation will be required. Compliance with Executive Orders 11988 (Floodplain Protection) and 11990 (Wetland Protection) will be assured through consultation with the Corps of Engineers (COE) and the associated Section 404 permitting process.
The Operators and the BLM will provide qualified representatives on the ground during construction to validate construction conformance with the approved design.

2. Erosion

Operators will conduct regularly scheduled monitoring of erosion control structures within the Fontenelle project area to ensure maintenance of the operating integrity of these structures. Monitoring procedures and schedules will be specified in ERRPs. Appropriate remedial action will be taken by the Operators to correct nonfunctioning structures.

3. Water Resources

The Operators will specify in their Erosion Control, Revegetation, and Stormwater Pollution Prevention Plans (SSPP) plans for conducting compliance evaluations at regularly scheduled intervals, but in no case less than once a year. This will include visual monitoring of surface waters to detect changes in water quality resulting from sedimentation. Periodic water samples will be collected, analyzed, and evaluated to ensure that produced water and water disposal methods, as well as any on-site discharge, are in compliance with federal and state water quality standards. In addition, if waters are discharged to the surface, the quantity of the water discharged will be monitored to ensure that releases do not exceed the abilities of existing drainage systems to convey discharge flows. Special measures will be taken to control runoff from roads and weldpads. Appropriate remedial actions will be immediately taken to correct any conditions in non-compliance.

4. Vegetation

Environmental Compliance Coordinators will monitor activities adjacent to wetlands to ensure that no discharge or fill will disturb these areas. Operators, in cooperation with the BLM, will be responsible for monitoring revegetation success using criteria specified in ERRPs. Standard success criteria will be attainment of 50% of predisturbance cover in three years and 80% of predisturbance cover in five years. When a site reaches 80% of predisturbance cover after five years, Operators will be released from continued monitoring requirements. The reclamation monitoring program shall include written documentation to be furnished to the BLM regarding the effectiveness and success of reclamation mitigation.

5. Wildlife and Fisheries

a. Operators, BLM, BOR, FWS, and WGFDF will identify opportunities to mitigate adverse wildlife impacts. The Operators, in consultation with the BLM, will institute by or jointly monitor raptor nesting and sage grouse lek use on, and adjacent to, their respective project areas to ensure that these sensitive resources are protected throughout the life of the project. In addition, breeding bird surveys may be required periodically by the BLM. Environmental Compliance Coordinators will also monitor project activity in big game crucial ranges during critical periods to ensure that no unauthorized use occurs and to ensure that authorized activities in these areas conduct the most efficient manner possible to limit potential adverse impacts.

b. Any big game, raptor, game bird, candidate, or sensitive species mortalities in the Fontenelle project areas noted by the Operators will be reported to the BLM and/or WGFDF as soon as practical.

6. Cultural and Historic Resources

In addition to Class III inventories, construction activities may also be occasionally field checked by a qualified BLM-permitted archaeologist. If historic or prehistoric materials are discovered during construction, all activities at the site will cease immediately, and appropriate BLM personnel will be notified by the Operators. This action is necessary to assure proper handling of the discovery by a qualified archaeologist.

7. Paleontological Resources

In areas of high paleontological value, a determination will be made by BLM whether a survey by a qualified paleontologist is necessary. In some cases, construction monitoring by a qualified paleontologist will be required to ensure that significant paleontological resources are avoided or recovered during construction.

8. Land Use

Operators' road signs (e.g., directional, speed limit) in the Fontenelle project areas will be maintained and monitored by the respective Operator. Operators will conduct all maintenance and monitoring operations to

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

C. Black-Footed Ferret - Proposed construction sites in the development area not examined in past surveys for prairie dogs will be examined prior to surface disturbing activities to confirm the presence or lack of prairie dog colonies. If prairie dog colonies are found, BLM or Operator qualified biologists will locate all project components to avoid direct impacts to prairie dog burrows. If this is not possible, surveys of prairie dog colonies (and ferrets where required by BLM and the FWS), will be conducted in accordance with FWS guidelines and requirements. Confirmation will be made of white-tailed prairie dog town and burrow distribution, the density of burrows, overall colony/splodge size, and any other data indicating whether the criteria established in the FWS 1989 guidelines for black-footed ferret habitat are met. This information will be provided to the FWS in accordance with Section 7 of the Endangered Species Act of 1973, as amended and the Interagency Cooperation Regulations.

d. Bald Eagle and Peregrine Falcon - In the event that bald eagle or peregrine falcon nests or roots are discovered in the project area, the BLM, BOR, FWS, and WGFDF would be consulted and appropriate mitigation measures would be implemented to ensure that no impacts occur to these species.

e. Loggerhead Shrike - If nests of loggerhead shrike are found within 500 feet of a well pad or access road during on-site inspections or during other clearance surveys, avoidance of the habitat site will be accomplished in consultation and coordination with the FWS and BLM.

f. Endangered Fish - The FWS Colorado River Endangered Fish Recovery Project, where depletion of water in excess of 100 acre feet from the Colorado River system occurs (FWS July 5, 1994), requires a depletion fee be paid to help support the Recovery Program. The DALEN and Lincoln Road RAPs are authorized to drill up to 1,292 wells over a ten year period. An average of 2 acre feet of water would be required for drilling, completion, road, and other construction activities per well. This means that an average annual depletion of 258 acre feet of water would occur from the Colorado River system. This would constitute eligibility for the one-time depletion charge to support priority recovery activities for endangered fishes. The current depletion rate, which is adjustable based on the Consumer Price Index, is $13.04 per acre-foot or $3,364.32. The Fontenelle Projects Operators shall make payment for the depletion charge by certified check or money order to the National Fish and Wildlife Foundation, 11230 Connecticut Ave., N.W., Suite 900, Washington, D.C., 20036.

15. Environmental Training Program

The Operators recognize the sensitive nature of the natural environment in the Fontenelle projects area. The Operators should institute an environmental training program for both contract personnel and Operators' employees involved in the infill development program. The training program should establish goals to reduce impacts to the environment.

16. Poaching and Littering Policies

The Operators should implement policies designed to control poaching and littering and should notify all employees (contract and company) that conviction of a major game violation could result in disciplinary action. Contractors should be informed that any intentional poaching or littering within the project area could result in their immediate release and/or charges could be leveled by BLM or the WGFDF.

17. Firearms and Dogs

Operators should commit to not allowing firearms and dogs on-site. The Operators, if not already in place, should develop an existing drug, alcohol, and firearms policy that will apply to all activities associated with the Fontenelle infill development projects.

II.3 MONITORING

Each Operator will provide a qualified individual to serve as their Environmental Compliance Coordinator, who will be responsible for assuring that, during the life of the project, mitigation measures are applied and monitoring activities are conducted as necessary to ensure impacts are minimized.

1. Transportation, Pipeline, and Well Location Construction
b. Any hazardous material spills will be handled as specified in SPCC Plans. Environmental Compliance Coordinators will be responsible for reporting spills of hazardous materials and implementing applicable procedures, monitoring, and reporting requirements.

9. Hazardous and Solid Waste

a. Hazardous materials used, produced, transported, stored, and disposed of as a component of this project will be in accordance with all federal and state rules and regulations.

SECTION III: STANDARD CONSTRUCTION PROCEDURES FOR SURFACE-DISTURBANCE ACTIVITIES

The following are Standard BLM construction procedures applied to surface-disturbing activities. These standards include the Bureau of Reclamation standards for oil and gas development entitled Stipulations for Surface Use - Oil and Gas Well Drill Sites and Access Roads. These measures will be applied, when and where applicable, to reduce environmental impacts.

1. Handling of Topsoil and Spoil

a. Before a surface disturbing activity is authorized, the amount of topsoil to be removed and topsoil storage areas will be specified (generally available topsoil up to 12 inches on well pads and central processing facility locations, and up to 6 inches on access roads and large pipelines).

b. The need to strip topsoil along buried pipelines, or other buried linear facilities, will be determined on a site-specific basis. The general policy is to strip topsoil unless it can be shown that operations will not negatively impact soil compaction, stability, or fertility if soil is not stripped.

c. Topsoil in excess of 6 inches, if available, may be stored so that it may be used in areas offsite that do not have adequate topsoil. Areas that have stored topsoil will be marked for use as borrow areas for other areas deficient in topsoil. Whenever possible, topsoil will be used for immediate reclamation. For topsoil stockpiles that are to be kept through the winter, erosion will be controlled by reducing the piles to less than 3 feet in height and by seeding and/or mulching.

d. Topsoil stockpile surface area will be maximized to reduce adverse impacts to soil microorganisms. All surface vegetation will be incorporated directly into the topsoil to augment organic matter content and seed sources unless brush is required to be handled separately.

e. For roads, available topsoil will be stripped from the construction area and placed in berms by sidecasting with a grader. After road construction, the topsoil will be spread back onto the road outslopes and cut slopes, and these areas reseeded.

2. Construction, Maintenance, and Reclamation of Roads

a. Recognized roads, as shown on the BLM Rock Springs District Transportation Plan, will be used when the alignment is acceptable for the proposed use. Generally, roads will follow natural contours, and will be constructed in accordance with standards as described in BLM Road Standards and BLM Manual 9113. All roads will be reclaimed to BLM standards.

b. Access roads will be designed to an appropriate standard no higher than necessary to accommodate their intended functions adequately. For example, the flexibility inherent in the BLM system for road design standards will be utilized in the location, design, and construction of dead-end resource roads (roads to well pads). The emphasis will be to locate and design the road so that it minimizes resource damage, including all factors that could lead to increased damage (resource impacts) both long and short term.

c. All roads in the gas field will be treated as "all weather roads." Soil compaction is required during road construction and culvert installation. Road surfacing needs will be determined based on the native soil characteristics and/or road subgrade material and its ability to support intended use without breaking down under adverse, wet conditions. If gravel surfacing is determined necessary by the authorized officer (AO), the road surface will be gravelled with 2-inch pit run or crushed gravel. All roads constructed by non-government entities across public lands will be designed by or under the direction of a licensed professional engineer, and the engineer will certify that the road was built as designed.

c. Fugitive dust suppression will be accomplished by the use of water or chemical control of dust during construction activities, by seeding soil stockpiles that will remain for more than one year, and by proper graveling of roads and wellpads. Use of produced water on roads will be prohibited unless such water contained less than 400 mg/l TDS and no hazardous waste.
d. The Operators will be responsible for preventive and corrective road maintenance on all roads associated with field operations. This includes crownining, cleaning ditches and drainage facilities, culvert installation, graveling, dust abatement, nonerosive weed control, or other requirements as directed by the AO.

e. Ripraps may be required at the inlet and outlet of some culvert installations. The need for riprap and the minimum size will be determined by the AO.

f. Surface runoff and sedimentation control will be incorporated in all access road design in accordance with BLM Manual 9113 guidelines and installation will be approved by the AO. Road grades, cut, ditches, culverts, sediment traps, material cut and fill, and topsoil and spoil areas will be designed and located in the field prior to construction.

g. Access road culvert location and spacing will be approved by the AO and will be in accordance with BLM Road Standards Manual 9113 Illustration 9, Recommended Spacing for Lateral Drainage Culverts in Various Soil Types.*

h. To control and reduce sediment from roads, guidance will be developed as appropriate to ensure: proper road placement; buffer strips to stream channels; graveling; proper drainage; seasonal closure; and, in some cases, redesign or closure of old roads.

i. On newly constructed roads and permanent roads, the placement of topsoil, seeding, and stabilization will be required on all cut and fill areas unless conditions prohibit this activity (e.g., the presence of bedrock). No unnecessary side-casting of material (e.g., during road maintenance) on steep slopes will be allowed.

j. Cooperative snow removal plans/agreements among affected operators may be required for roads that have winter use so that snow removal does not adversely affect drainage systems, reclamation efforts, big game movements, or other resources adjacent to the road.

k. Reclamation of abandoned roads will include ripping/dicing, reshaping, recontouring, resurfacing with topsoil, installation of water bars, and drill seeding on the contour. The removal of structures such as bridges, culverts, cattlegards, and signs is usually required. Stripped vegetation will be spread over disturbed areas to allow nutrient recycling, where practical. Fertilization or fencin of surface disturbances will not normally be required. Additional erosion control measures (e.g., fiber matting) and road barriers to discourage travel may be required.

1. On Bureau of Reclamation-administered lands, low water crossings shall be constructed, into and out of any such crossing, on an existing road (which will be upgraded) or new road at 4:1 approaches. A layer of six to eight inches of gravel shall be placed on the approaches.

m. Cattlegards and culverts will be installed as needed on existing roads to be upgraded and on newly constructed roads.

3. Construction of Wellpads and Facilities

a. Prior to construction, the proposed pad location will be surveyed and staked, and all erosion control design considerations will be reviewed (see Oshore Operating Order No. 1 for required engineering and design information). Wellpads will be designed to be parallel to the contour with the reserve pit on the uphill side of the pad whenever possible. Reserve pits will be constructed in cut. Reserve pits will be lined with an impervious liner. Wellpads will be designed and constructed to disturb the smallest practicable area necessary to provide for efficient and safe operations.

b. All cut and fill slopes with greater than 3-foot cut and/or fill will be seeded at least 50 feet on slopes to identify where topsoil will be removed. Up to 12 inches of topsoil will be removed. Wellpads will also be designed to topsoil can be stripped and stored prior to any other dirt work. All cut and fill work will be designed to minimize the amount of spoil material required during pad construction.

c. If excess spoil is generated, it will be incorporated into the pad fill slope by compacting the spoil in 6-inch lifts using water and rubber-tired vehicles and/or sheep foot rollers, or it will be placed in designated areas and stabilized. All precautions necessary to stabilize structures will be taken during construction.

Areas of the pad that support the drill rig and any other heavy equipment will be compacted.

d. During construction, interceptor ditches will be installed above the cut, where necessary. Collector ditches and sediment control structures, designed for

a 10-year/24-hour event, may be required below the fill. Flows less than the 10-year/24-hour event will be drained and/or collected before being discharged from the disturbed area. Qualified supervision will be provided during the installation of all erosion control structures including the construction of berms, dikes, trenches, and the cut-slope fill.

e. No surface disturbance will be allowed on slopes in excess of 25% unless erosion control and adequate revegetation can be ensured. Detailed engineering proposals, revegetation and restoration plans, and a site-specific environmental analysis will be required in these areas.

f. Reserve pit construction will occur at each drilling location prior to start of drilling operations. In line with requirements elsewhere in the Rock Springs District, the pit liner permeability will be less than 10^-7 cm/sec and have a burst strength equal to or exceeding 300 pounds per square inch (psi), a puncture strength of 160 psi, or greater and granular tensile strength of 150 psi or greater. The liner will be resistant to deterioration by hydrocarbons. Liners will not be installed directly on rock. Where necessary, pits will receive a layer of bedding material (e.g., sand or geotextile fiber liner) sufficient to prevent contact between the liner and any exposed rock. The pad will be designed so that runoff from adjacent slopes does not flow into the reserve pit.

g. No trash will be disposed of in the pit. Pits will be fenced on three non-working sides during drilling. After drilling is completed and the rig dismantled, the fourth side of the pit will be fenced until the pit is reclaimed. All four corners will be braced. Fence construction will be on the cut or undisurbed surface and will keep livestock and wildlife from using the pit. Operators will flag or cover reserve pits with netting to discourage their use by migratory waterfowl.

h. On producing locations, spoil material will be replaced as close to original contours as the practical considerations of the various facilities allows. Operators will be required to reduce cut and fill slopes to 5:1 or less. In those areas where spoil grading is not possible, spoil will be graded to a gentle slope capable of maintaining a temporary vegetation cover for erosion control. Terraces or elongated water breaks (erosion control measures) will be required after slope reduction. Facilities will be required to approach zero runoff from the location until the area is stabilized to avoid contamination and water quality degradation downstream. All unused portions of facilities on producing well locations will be reduced to 3:1 or less. Slopes will be reduced, resurfaced with topsoil, and seeded with soil stabilizing native species. Topsoil will be taken from the storage pile and spread 6 inches or more deep onto the unused portion and chiselled on the contour.

i. On wellpads and larger locations, special attention will be given to sections of the surface use plan covering reclamation. This plan will include objectives for successful reclamation including: soil stabilization; plant community composition; and desired vegetation density and diversity.

j. Pumping units and/or compressor units shall have a muffler installed for noise control.

k. Tank batteries shall be bermed to one and onehalf times the capacity of the tank.

l. Portable chemical toilets shall be placed on the site for all phases of drilling and surface facilities completion.

m. Water wells shall not be drilled on any Bureau of Reclamation site. A water removal permit from the Wyoming State Engineer shall be obtained, and a copy shall be provided to the BLM and Bureau of Reclamation.

n. Construction crews shall not be allowed to reside in any developed campgrounds or undeveloped areas of the Seedskadee Project.

o. The BLM shall be notified 72 hours after rehabilitation of well locations, access roads, and pipelines for an on-site compliance inspection.

4. Construction and Reclamation of Gathering Pipelines and Powerlines

a. When constructing or reclaiming gathering pipelines and powerlines, existing crowned and drained roads will be used for access where practical to minimize surface disturbances. Gathering pipelines (usually 3- to 4-inch diameter) may follow new or existing roads or existing buried pipelines wherever practical. Pipeline trenches will not be placed in access road borrow ditches unless no other reasonable alternative is available.

b. Generally, gathering pipelines will be laid on the surface when slopes are over 25% and where rock outcrops are crossed. When possible, they will be
built perpendicular to the contour to minimize the amount of area required for construction.

c. Gathering pipelines placed adjacent to access roads. This method of gathering pipeline placement is not always the best solution for reducing disturbance. Placing gathering lines adjacent to access roads can create more problems than it solves. Pipelines cannot always follow the curves of access roads. This may be best solution in mountainous/forested terrain. However, pipeline route should be addressed at same time as road during on-site. Gathering pipeline installation standards should be addressed.

d. Gathering lines could be installed by disturbing no more than one blade width (14 feet) of vegetation over the non-working side of the trench. The top 4 to 6 inches of topsoil and vegetation would be windrowed to the outside of the cleared ROW and the spoil material then placed on the cleared ROW. It is essential to keep the spoil separate from the cleared vegetation so that proper compaction can occur around the pipe during backfill. If vegetation (brush) gets mixed in, settling and piping occurs which can cause serious erosion problems later on. No clearing of the working side of the ROW would occur, unless, in some cases, a brush-bog, brush-beater, or blade would be used to clear the right-of-way.

e. Clearing of gathering pipeline and powerline ROWs will be accomplished with the least amount of disturbance necessary. Vegetation will be removed, if necessary, from the ROW with a brush-beater or blade so as to leave root systems intact, and spread over the disturbed area to provide protection, nutrient recycling, and a natural seed source.

f. Gathering pipeline trenches will be excavated with a backhoe, wheel trencher, or other appropriate section that is approved and then is disturbed other than the area occupied by the trench itself. Topsoil will not be segregated from subsoil. Once the pipe is placed in the trench, soil will be replaced. No visible soil ball is to be provided. Areas that do not meet this requirement will be brought into compliance and resurbed.

g. When the need is clearly identified through an environmental analysis or monitoring studies, linear disturbances will be fenced to protect revegetated areas from damage due to domestic and wild animals and off-road vehicles.

h. If linear facilities follow the same ROW for all or part of the route, they will generally be required to be constructed so that only one erosion control plan is necessary. Generally, they will be constructed either concurrently or during the same field season.

5. Reclamation

a. Reclamation will be required on all disturbed areas. On roads left intact for access purposes, the stabilization of all disturbed areas, except the running surface, will be required.

b. Reclamation (by the operator or grant holder) will be initiated as soon as possible without disturbance. Construction of erosion and runoff control measures and placement of topsoil will be required after recontouring. Continued efforts will be required until satisfactory vegetation cover is established and the site is stabilized.

c. Site-specific reclamation plans will identify and provide reclamation erosion control methods for potential surface water impacts from pipeline stream crossings. Stream channels will be restored to preconstruction grade and stabilized using appropriate methods such as ripraps, gabions, bulkhead retaining walls, timbers, hay bales, and silt fences.

d. The collection and analysis of soil samples from disturbed areas may be required as part of reclamation plans. Physical properties of the soil, mixtures and mixtures deficiencies. Soil testing and reports will be the responsibility of the contractor or lessee, with the approval of the BLM. Testing (as defined by BLM) may include: pH, mechanical analysis, salt, exchangeable sodium percentage, nitrogen, phosphorus, and potassium content.

e. Fertilization may be required if there is evidence of a nutrient deficiency. Topsoil and selected seed species will be inoculated with soil microorganisms when necessary to improve seed germination and growth. The site will be seeded (broadcast, drill, hydroseeding) and soil cover will be increased to at least 30% for sand 35% for clay loams. No soil cover will be allowed to remain unseeded longer than 30 days. The site will be maintained free from erosion until the site is deemed necessary by the Operator or grantee for any further liability.

f. Off-road vehicle barriers consisting of boulders, pylons, brush piles, or other feasible barriers will be installed on a site-specific basis as determined by the AO.

6. Seeding

a. On all areas to be seeded, seed mixtures will be composed of native species, and be site-specific. The introduction of non-native species into natural ecosystems is restricted by Executive Order 11987 and BLM Manual 1745. If a non-native plant species is recommended for use in the reclamation mix, an Environmental Analysis must be performed as directed by BLM Manual 1745, and the BLM must ensure that the introduction of exotic species is ecologically sound and will not adversely impact natural ecosystems. Due to the major importance of the area for crucial antelope habitat and in the interest of maintaining species biodiversity, wildlife habitat needs and the maintenance of native vegetation types will be given priority consideration in the development of reclamation seed mixtures.

b. Topsoil will be distributed uniformly on the area to be reclaimed. If only 2 to 3 inches of topsoil are available for reclamation, it may be mixed with the top 3 inches of "acceptable" soil at the time of stockpiling. If 4 to 6 inches of topsoil are available, mixing with topsoil will be allowed. Following topsoil application, seed bed preparation procedures will be determined on the basis of the physical and chemical characteristics of the topsoil and the physical nature of the site itself. A friable, but firm, seed bed will be established.

c. Final seed bed preparation will be scheduled for completion immediately prior to seeding to maximize seedling effectiveness and reclamation establishment. If top soil spread is completed on a site during spring and seeding is delayed until fall, a suitable cover crop (an annual grass) will be broadcast seeded for seed stabilization and weed control.

d. Disturbed areas will generally be seeded using a drill equipped with a depth regulator. Seed will be drilled on the contour and planted between one-quarter and one-half inches deep. On steep or rocky terrain, where drilling is not possible, or at the discretion of the operator or lessee responsible for seeding the area, the AO will be required to approve the method. The AO will release the operator or grantee from any further liability.

1. Off-road vehicle barriers consisting of boulders, pylons, brush piles, or other feasible barriers will be installed on a site-specific basis as determined by the AO.

2. Seeding...
climate will be formed by the grasses and forbs that should enhance shrub establishment.

f. Operators or their contractor will present seed tags to BLM AO and will notify the BLM AO prior to seeding to provide opportunity for AO to have an inspector on-site during seeding.

g. Representative seed mixes and seeding rates are presented in Tables III-3, III-4, and III-5. The seeding rate will be doubled if the seed is broadcast.

h. Standard success criteria will be based on the attainment of total vegetation cover, not species specific cover. Standard success criteria will be attainment of 50% of predisturbance cover in three years and 80% of predisturbance cover in five years.

i. Follow-up soil testing, seeding, and/or corrective erosion control measures will be required on areas of surface disturbance that experience reclamation and/or erosion control failure.

7. Treatments

a. Mulches will be applied on seed beds with high soil erosion potential or where seed bed microclimate may limit establishment. Any mulch used will be free from mold, and noxious weed seeds. Mulch may include native hay, small grain straw, wood fiber, live mulch, cotton, jute, synthetic netting, and rock. Straw mulch should contain fibers long enough to facilitate crimping and provide the greatest cover. Some type of matting may be required in more severe conditions such as steep slopes, sandy soils, and other poor sites that seed site condition modifications to enhance seeding success.

b. The operator, grantee, or lessee will be responsible for the control of all noxious weed infestations on surface disturbances. Control measures will adhere to those specified in the Rock Springs District Noxious Weed Control EA (USD1 1982a) or the Regional Northwest Area Noxious Weed Control Program EIS (USD1 1987).

c. Ripping and chiseling will be used to break up compacted soils, increase water penetration, promote root growth, and control erosion. Ripping to a depth of 2 feet will normally be used on compacted soil material and old road beds prior to topsoil spreading. Chiseling to a depth of 12 inches on the contour will be done after the site is contourd, ripped, the topsoil is spread, and soil amendments added. On sites where quick establishment of shrub and/or small tree species is desirable, bare rooted and containerized species will be hand planted to supplement drilling or broadcast seeding. Shrub species will be planted in areas where wildlife forage is essential, mass slope failure is possible, or at stream crossings to facilitate site stability and wildlife habitat restoration. Hydroseeding may be required on steep, gravelly slopes which require the seed to be "anchored" onto the soil surface prior to mulching. Care will be taken to assure that the carrier solution is not harmful to the seed mix components.

### Table III-4 Recommended Seed Mixtures for Sandy Soils

<table>
<thead>
<tr>
<th>Species</th>
<th>Variety</th>
<th>Drill Seeding Rate 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickspore wheatgrass</td>
<td>Cimarron</td>
<td>3.0</td>
</tr>
<tr>
<td>Western wheatgrass</td>
<td>Cimarron</td>
<td>3.0</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td></td>
<td>3.0</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td></td>
<td>3.0</td>
</tr>
<tr>
<td>Bluefescu</td>
<td>0.23</td>
<td></td>
</tr>
<tr>
<td>Scarlet globemallow</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Wintersage</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Wyoming big sage</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>17.23</td>
</tr>
</tbody>
</table>

1'Drill Seeding Rate = Lbs/Acre Pure Live Seed (PLS)

### Table III-5 Recommended Seed Mixtures for Saline/Sodic Soils

<table>
<thead>
<tr>
<th>Species</th>
<th>Variety</th>
<th>Drill Seeding Rate 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western wheatgrass</td>
<td>Rosanna</td>
<td>4.0</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td></td>
<td>2.0</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td></td>
<td>3.0</td>
</tr>
<tr>
<td>Bristlebush squarros</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Alkali sacaton</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Rocky Mountain beavplant</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Scarlet globemallow</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Black grasseswood</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Usneral saltbush</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Shadscale</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>19.0</td>
</tr>
</tbody>
</table>

1'Drill Seeding Rate = Lbs/Acre Pure Live Seed (PLS)
IV. OPERATOR-COMMITTED CONSTRUCTION, OPERATION, AND RECLAMATION PRACTICES AND APPLICABLE EIS MITIGATION

Sub-Section IV.1 lists the construction, operation, reclamation, and abandonment practices that the Fontenelle Operators, as described in the Fontenelle Projects EIS, committed to implementing to protect the environment during the development of the DALEN and Lincoln Road projects. Operator-committed practices or measures not consistent with accepted standards or that are changed as a result of the EIS, are not listed.

The Fontenelle Projects EIS identified additional mitigating opportunities to reduce impacts on certain resources. Those measures considered reasonable for Operator implementation are brought forward from the EIS into this Section and are listed under Sub-Section IV.2 as additional measures or as measures replacing Operator measures. Some measures are not within the administrative authority of the BLM to require and therefore are identified as measures the Operator "could" or "should" implement.

The following environmental protection practices will be incorporated into the development of the DALEN and Lincoln Road projects through the permitting process (APD, SN, and ROW, or other permit) as appropriate for each proposed well, access road, pipeline, central facility, etc.

IV.1 OPERATOR-COMMITTED PRACTICES AND MITIGATION MEASURES

A. Construction and Drilling Schedule

1. DALEN’s Schedule. Construction and drilling activities will be scheduled annually to take advantage of dry weather conditions in the summer and fall. Generally, operation will be between early June and the end of November, depending on weather conditions. Completion activities will immediately follow drilling of each well. Construction of roads and pipelines will occur during the same time period. The schedule is designed to conform with restrictions imposed on crucial wildlife winter ranges and to avoid extensive damage to soils during winter portions of the year.

2. Lincoln Road Operators’ Schedule. Infill drilling of the Lincoln Road Project Area is ongoing. Completion activities will immediately follow drilling of each well. Where outside of crucial wildlife winter range, the operators will drill new wells year-round.

3. The BLM shall be notified no later than three (3) days prior to commencement of construction activities.

B. Transportation Requirements

1. Workers, materials and equipment will be transported to the project areas over Interstate 80 (I-80), State Highways 28 and 372, U.S. Highways 189 and 191 and various County, BLM and operator-maintained roads (see Figure 1-1). DALEN and the Lincoln Road Operators will comply with existing Federal, State and County requirements and restrictions developed to protect road networks, the travelling public and adjacent landowners and their property.

2. The Lincoln Road Project Area and DALEN’s Fontenelle II Unit are already served by a network of roads, some designed to carry heavy truck traffic. County and State road load restrictions will be followed at all times to prevent damage to the road surface. Arrangements will be made with the Wyoming Transportation Department and Lincoln and Sweetwater counties, as required, to transport diesel fuel and other needed items. DALEN and the Lincoln Road Operators will observe the weight load limit on Fontenelle dam at all times.

C. Well Locations, Construction, Drilling and Completion, Reclamation, Operation and Maintenance, and Abandonment

1. Well Pad Locations

   a. The DALEN and the Lincoln Road Operators Resource Protection Alternative (RPA) well locations are listed in Appendix D.

2. Well Pad Construction

   a. Standard industry practices and surface control stipulations for the construction of well pads will be applied to both drilling programs. On-site inspections of each drilling location by the BLM may result in additional conditions of approval that modify site-specific and reclamation measures on public lands.

   b. Once the location for an individual well is determined and approved by the BLM, the well location will be marked with an identifying stake and the well pad will be completed immediately. Construction and completion will take approximately one week. Construction of each well pad, including consideration for fills, spoil and topsoil stockpiling, will disturb approximately 3.8 acres. Areas for stockpiling topsoil will not be graded or graded. A typical production site following reclamation will disturb 0.7 acres for the life of the well.

   c. Up to 12 inches of topsoil, where available, will be removed from the well pad during construction and will be stockpiled adjacent to the well site for later use in reclamation. The location of topsoil stockpiles will be agreed upon by the BLM and the company during the on-site inspection. BLM may require well sites be graded to facilitate access on and off of the drilling location and to prevent soil damage from vehicle and equipment rutting on the well pad. The gravel will also help reduce off-site sedimentation from the well pad.

   d. Reserve pit lining will be as specified under water resources, Section III.

   e. No trash will be disposed of in the pit and the pits will be fenced on three non-working sides during drilling. After drilling is completed and the rig dismantled, the fourth side of the pit will be fenced until the pit is reclaimed. All four corners will be braced with an H-type brace.

   f. If a well pad is constructed but the well is not drilled, the well and access road will be reclaimed in accordance with standard BLM stipulations/conditions or the operator will be required to implement erosion control measures in compliance with BLM operating standards.

   g. Well drilling and Completion

      a. A mobile rotary drilling rig will be used for drilling the wells. The drilling rigs will be powered by diesel engines and the drill fuel will be supplied by tanker truck and temporarily stored in tanks at each drilling location. The operator is responsible for supplementing and updating its SPCC Plans to address emergency procedures that should occur on or off the well pad or during transportation of fuels.

   b. Water for mixing of drilling fluids will be trucked or piped from existing water wells or purchased from a local supplier and stored in tanks or at the drill site.

   c. Portable dumpsters will be provided for trash at each drilling location and the trash will be hauled off-site for proper disposal. No burning of trash will occur. Portable chemical toilets or holding tanks will be provided for sewage. All sewage will be disposed off of public land and in accordance with County and State requirements.

   d. Drilling and casing of most wells will be accomplished in approximately 12 days. At that time, the drilling rig will be moved to a new location and other equipment will be brought in for perforating, stimulation and final completion operations. Final completion of the well may require up to an additional two weeks after drilling and the running of casing is completed.

   e. Specific drilling procedures may vary. The exact drilling program will be approved at the APD stage. Operators will use standard American Petroleum Institute (API) casing to ensure that the casing can withstand the forces of tension, collapse and burst. The drilling process varies between the DALEN and Lincoln Road Projects. In the DALEN Project, a 12 1/4-inch surface casing hole will be drilled to a depth of approximately 850 feet; a 5 5/8-inch surface casing is set in the hole and cemented back to surface; a 7 7/8-inch production hole is drilled to the target formation; the hole conditioned and a 4 1/2-inch casing is installed from the surface of the hole to total depth; and the entire length of casing is cemented from total depth to surface. In the Lincoln Road Project, the process is the same except the surface casing hole is drilled to a depth of 1,500 feet. Some Lincoln Road Operators have varied this procedure by adopting a slim-hole design. A 9 7/8-inch casing hole is be drilled to a depth of 2,500 feet; a 7 7/8-inch surface casing is set in the hole and cemented back to surface; a 6 1/4-inch production hole is drilled to the target formation; the hole is conditioned and a 3 1/2-inch casing is installed from the surface of the hole to total depth;
the casing is cemented from total depth to a level 200 feet above the top of the 1st Frontier Formation. The casing will be cemented using highly specialized equipment to mix dry cement and water into a slurry which is pumped through the casing string and forced up the annular space between the casing and the formation where it will harden.

f. The cementing method used ensures that the original annular space between formations that existed prior to the drilling of the well, 2) to provide support for the casing by preventing formation pressures from acting directly on the casing; and 3) to retard corrosion by minimizing contact of the casing with corrosive formation fluids. This allows further protection against contamination of shallow aquifers.

g. After the well has been perforated to allow communication between the cased well and the formation fluids, the well may have to be hydraulically fractured to improve the flow of formation fluids into the wellbore.

4. Interim Well Pad Reclamation
   a. Site rehabilitation and reclamation will commence typically about 15 days after well completion. The pit is dewatered or fluids are allowed to evaporate. Pit dewatering or chemical fixation/solidification will allow backfilling and reclamation to occur within a week of completion operations. These methods may be used for certain sensitive sites. Fluids removed from the pit will either be reused or trucked to a WDEQ-approved disposal facility.
   b. The pit will be backfilled after drying and site recontouring will begin as soon as the pit is backfilled. Pit dewatering and backfilling will generally be completed within three months. Under normal weather conditions approximately one month will be allowed for backfill to settle after which final recontouring, topsoil spreading, and seeding will take place. However, if the well is completed late in the year, erosion control measures will be implemented following completion of the well and final reclamation will be completed the following fall.

c. Seeding will be accomplished during the fall (September or October) as directed by the BLM. Specifications for seed mixtures to be used in reclamation will be determined on a case-by-case basis. The mixture will be certified to weed-free and a copy of the certification will be supplied to the BLM prior to planting. The entire disturbed location may require fencing after seeding by overgrazing by livestock, wildlife, or wild horses is precluding successful revegetation. Fences and cattle guards will meet BLM specifications. Once the location has been reclaimed and vegetation reestablished, the fence will either be removed or the fenced area reduced as required by the BLM.

d. If a well is a dry hole or non-producer, the entire drilling location and access road will be reclaimed. The hole will be plugged in accordance with WOOGCC and BLM abandonment procedures.

5. Well Operation and Maintenance
   a. Production location is constructed and production facilities installed after well completion and interim well pad reclamation. All of the well pad, except for approximately 0.7 acres, will be reclaimed. This disturbance will remain unreclaimed for the productive life of the well.
   b. Above-ground production facilities at each location will include a combination of methanol pump, glycol pump, condensate and produced water storage tanks, a three-phase separator and heater, a dehydration unit, and meter run. The production facilities will be designed and laid out to maximize interim well pad rehabilitation. This equipment will be located a safe distance from the wellhead. All tanks, treaters, dehydrators and other production facilities installed on location and designed to contain any oil, glycol, produced water, or other fluid which may constitute a hazard to public health or safety must be situated within and surrounded by a berm made of an impervious material designed to contain not less than 110 percent of the capacity of the largest vessel. The entire area within the berm area must be sealed with an impervious liner to prevent the migration of fluid into the ground. Water and condensate will be trucked from the site for disposal or sale.

c. The gas will then be metered and flow into a gathering pipeline. From the production facilities at each well site, gas will be delivered for sale via gathering pipelines.

d. All above-ground production facilities will be painted a earth tone color, Carlsbad Canyon (Munsell Soil Color), within 6 months of well completion. No outdoor area lighting fixtures will be installed at production locations.

6. Well Abandonment
   a. Pluggung and abandonment of each well will follow the procedures of the WOOGCC and BLM. Upon abandonment of wells on public lands, the operators will be required to contact the BLM for approval of a final abandonment plan. All surface production equipment will be removed from the site and the production location area and roads will be recontoured as soon as weather permits. The production location and access road will be seeded during the fall, as directed by the BLM.

6. Access Road Construction, Reclamation, and Abandonment
   a. Access Road Construction
      a. Most new road construction will be designed to access individual well sites. A road network presently exists within portions of both project areas. Standard road construction methods and construction equipment, such as crawler tractors, graders and motor scrapers, will be employed during construction of the new roads.
      b. All access road location and construction design will be in accordance with the road development and transportation plans approved by the BLM. The road design will include standard BLM road construction standards. Following approval of the road design plan and APD, the road right-of-way will be staked in accordance with the design plan. Construction staking consists of determining finished site elevations, cut and fill slopes and their respective catch points, drainage, balanced earthwork and other necessary construction features.

   b. During reclamation, damage by erosion or other causes will be repaired after the completion of grading and before beginning revegetation operations. Repair activities will include filling gulls, smoothing irregularities and repairing other incidental damage.

   c. The road right-of-way will be prepared by clearing, grubbing, trimming and removing of vegetation. This work will include preservation of vegetation and objects designated to remain free from injury or defacement. All debris, trees, stumps, roots and other protruding vegetative material within the clearing limits will be removed. Width of the construction right-of-way and roadway will be reduced as necessary to conform to the road design plan.

   d. Up to 6 inches of topsoil (where available) will be stripped from all areas disturbed during road construction and deposited on the outside edge of the right-of-way apart from other excavated material.

   e. In areas of weak soils, not conducive to supporting the loads of construction traffic, the new roads will need to be gravelled. Soil sampling will be conducted to indicate the locations where gravel will be necessary and the amount of gravel required.

2. Access Road Reclamation
   a. Once road construction is complete, road ditches and areas disturbed for the placement of structures will be reclaimed. After the slopes and ditches have been shaped and smoothed as required, the stored topsoil/vegetation debris stockpiled on the outside edge of the right-of-way will be evenly spread over exposed subsoil (except for the roadway) and be seeded with the approved seed mix (see Section A-III, Tables III-1, 2, & 3).

   b. During reclamation, damage by erosion or other causes will be repaired after the completion of grading and before beginning revegetation operations. Repair activities will include filling gulls, smoothing irregularities and repairing other incidental damage. Immediately in advance of seeding, anycrusted surface will be scarified at right angles to the slope plane. All earth cut or fill disturbed in the course of construction, revegetation or heavy maintenance large will be revegetated with a seed mix approved by the BLM.
constructed 10 success. The culverts of open pipelines. DALEN owns producer approval for cross roads. Other existing pipelines will be cleaned 10 remove used for cross drains will be removed. Revegetation continues until an acceptable level of success, as determined by the BLM, is achieved.

Gathering Pipeline Systems, Construction, Hydrostatic Testing, Maintenance and Operation, and Abandonment

1. Gathering Pipeline Systems
   a. Construction of gathering pipelines to serve the new wells will require different techniques for each project. DALEN owns the gathering system utilized to transport gas from the Fontenelle Unit. However, the Lincoln Road Operators depend on third-party gas transportation companies to deliver gas from each well site.
   b. Gathering pipeline is typically 3 to 4 inches in diameter. The design, materials, construction, operation, maintenance and abandonment of the gathering system pipelines will be in accordance with American Petroleum Institute 1104 and safe and proven engineering practices.
   c. Scrapper launchers and traps will be located at selected valve sites. Scraper traps and launchers will be used to clean and remove condensed liquids from inside the pipe during start-up and maintenance. During maintenance, an internal scraper (or pig) will be placed into the scraper launcher and forced by gas pressure through the pipe. The pig will be caught at the scraper trap and removed along with the debris.

2. Gathering Pipeline Construction
   a. Construction of the Fontenelle Operators’ gathering pipelines will follow standard pipeline construction methods. However, the clearing of the right-of-way will not be as proposed by the Operators in the EIS. Section IV, Construction and Reclamation of Gathering Pipelines, describes the construction practices that will be applied.
   b. Generally, the proposed gathering lines will require a much narrower construction right-of-way—typically 25 to 50 feet. Final dimensions of the construction right-of-way will depend, in part, upon pipeline-diameter and local topography. Final dimensions will be reviewed and approved by BLM prior to the start of construction. However, in areas with steep slopes or during hillside construction, extra temporary work space may be required beyond the 75-foot wide construction right-of-way. Because all pipeline rights-of-way will be reclaimed following completion of construction, no production-related disturbance will be associated with the buried pipelines.
   c. Landowners, permitees and other regular users of lands that will be traversed during construction will be notified in advance of construction activities which could affect their businesses or activities. During construction, contractors will be required to regulate access and vehicular traffic as necessary to protect the public and livestock from hazards associated with construction.
   d. Rights-of-way limits for pipelines will be staked. Construction-related traffic will be confined to the staked rights-of-way.
   e. Where construction could result in breaks or destruction of a natural or man-made barrier used for livestock control, gaps thus opened will be temporarily fenced to prevent passage of livestock. The fence will be reconstructed to BLM specifications or to the satisfaction of the landowner. Each fence crossed by the rights-of-way will be braced and secured to prevent slacking of wire before cutting the wire for equipment passage. The opening will be temporarily closed during construction to prevent passage of livestock. Gates will not be locked or closed on established roads on public lands unless the gates were originally locked or closed. Fences, cattle guards or gates damaged during construction will be repaired to a condition equal to or better than the original condition.

3. Hydrostatic Testing
   a. The continuity of the pipelines will be hydrostatically tested for leaks or weak spots at 1.25 times the maximum anticipated operating pressure. All leaks that are found will be repaired and the water will be removed from the pipeline and disposed of in accordance with appropriate State and Federal regulations. The testing procedure usually does not contaminate test water, although small amounts of soil and metal fragments may be entrained. Water to test the pipelines will be taken from existing water wells or purchased from suppliers.
   b. Hydrostatic testing of 65 miles of gathering line, as proposed by DALEN, will require 0.7 acre-feet of water. Testing of the 382 miles of gathering line proposed by the Lincoln Road Operators will require 4 acre feet of water. A discharge permit may be required.

4. Maintenance and Operation
   a. Pipelines will be operated and maintained in compliance with applicable industry standards. Field personnel will monitor and control the systems by driving through the project area inspecting facilities and checking gauges. Field inspections will generally be performed on a daily basis.

5. Gathering Pipeline Abandonment
   a. Upon reaching the end of the useful life of the pipelines, an abandonment plan will be developed and approved by the BLM. The pipeline owner will be required to remove all surface facilities, including surface pipelines, and reclaim any disturbed areas.

6. DALEN’s Gathering System
   a. DALEN will place all gathering pipelines on the ground surface rather than burying the pipelines. This is preferred to protect sensitive visual resources, protect highly erodible soils (which are difficult to reclaim), and reduce forage loss in big game winter range. Therefore, pipeline construction will not necessitate any surface disturbing activities (i.e., grading, blading or ditching). In most cases, it will not be necessary to remove vegetation from the right-of-way. Disturbance will be limited to vehicular traffic along the right-of-way during installation. Vegetation will be subject to trampling by pipeline construction crews and vehicular traffic and some limited vegetation clearing may occur in some areas. Scarring of the disturbed areas could be required where soils are compacted.

7. Lincoln Road Operators’ Gathering System
   a. Gathering pipelines will be constructed to tie the new wells drilled in the project area to existing WFS and Western Gas Resources Company gathering pipelines. Approximately 63 percent of this new pipeline will be laid adjacent to new roads in a road right-of-way. Final dimensions of the road-right-of-way will be reviewed and approved by BLM prior to construction.

All of the existing pipelines traversing the Lincoln Road Project Area are buried. This construction technique is different from that utilized by DALEN because of the absence of visual concerns.

IV.2 MITIGATION MEASURES BROUGHT FORWARD FROM THE FONTENELLE PROJECTS EIS

The following mitigation measures were identified in the Fontenelle Projects EIS as additional opportunities to reduce impacts from project implementation. The measures brought forward into this ROD are considered reasonable for Operator implementation. Some measures are not within the administrative authority of the BLM to require and therefore are identified as measures the Operator "could" or "should" implement.

A. Socioeconomic Resources

1. DALEN and the Lincoln Road Operators should confer with local officials and the Sweetwater Economic Development Association, about the projects. Completion of the housing supply and demand study in the Rock Springs-Green River area by the Sweetwater Economic Development Association (1995), may have identified assistance opportunities for the Operators.
B. Transportation

1. ALEN’s existing transportation plan will be modified, where needed, to address new road construction and maintenance of roads not covered by the existing plan.

2. Transportation plans will incorporate consideration for additional road closures in two forms: 1) permanent closure of oil field operations roads not needed and 2) installing gates on oil field operations roads where necessary to reduce traffic and protect other resources (e.g., wildlife) from impacts described elsewhere in this EIS.

3. Lincoln Road Operators will prepare annual or incremental transportation plans following the Road Development Plan formed in the Lincoln Road Project Area. The plan will include consideration of the following:
   - Major access roads to be used by heavy trucks entering and leaving the Project Area.
   - Depth of gravel to be applied to new and proposed roads.
   - Additional drainage structures, culverts, etc., needed on existing and proposed roads.
   - Directional signage—especially at intersections with other three-lane roads.
   - Plans to maximize the use of existing roads and minimize new surface disturbance.
   - Dust abatement measures to reduce fugitive dust.
   - Speed limits to reduce fugitive dust, speeding, and vehicle-animal collisions.

4. Workers will be expected to park in designated areas at each construction site. Parking on road shoulders will be prohibited. Vehicle speeds should be posted on local, collector, and arterial roads. Fugitive dust will be a factor used to determine vehicle speeds on these roads.

5. Heavy truck traffic will not use the road across Fontenelle dam or use roads within Seedskadee NWR except for through traffic on State Highway 28.

C. Recreation Resources

1. The Blue Forest certified wood collecting area (approximately 500 acres in parts of four sections) will be an avoidance area for surface disturbance activities, including wetland clearing, access roads, well pads, and burned pipelines.

2. Operators should inform their employees, contractors, and subcontractors that “The maximum quantity of perturbed wood that any one person is allowed to remove without charge per day is 25 pounds in weight plus one piece, provided that the maximum total amount that one person may remove in one calendar year shall not exceed 250 pounds” (43 CFR 3622.4).

3. Operators should prohibit firearms at work sites to reduce vandalism and destructive “pinking.”

4. Operators should inform their employees, contractors, and subcontractors that long-term camping (greater than 14 days) on public lands or at public recreation sites is prohibited.

5. Operators should inform their employees, contractors, and subcontractors that recreation sites and facilities are not to be used for trash disposal or as a water supply.

6. Project-related traffic in excess of road weight limits will avoid the road across Fontenelle dam.

7. To decrease potential conflicts with recreation users and traffic, all operators should place directional signage as necessary on new access roads to inform hunters and other users that they are entering an oil and gas drilling area.

8. Visual Resources

   1. Well drilling and natural gas production is not incompatible with a visual resource management (VRM) Class II or III, provided site-specific measures are taken to reduce the visibility of surface facilities. Such measures will include placing facilities away from the edge of bluffs or steep slopes, painting facilities earth-tone colors, using topography and/or vegetation to screen the facility from view, avoiding steep slopes or areas where extensive cuts and fills are necessary, and implementing reclamation and revegetation procedures.

   2. Within VRM Class II and III areas, every effort will be made to avoid the introduction of new, linear visual intrusions on the landscape. New road and pipeline corridors will follow existing two-track roads or dirt roads where they lend themselves to proper road design and location criteria. New pipelines will be combined with existing or proposed roads and new cross-country pipeline corridors avoided wherever feasible. To reduce cumulative impacts, existing tank batteries, production equipment and buildings which have been constructed of reflective materials will be painted an earth-tone color that blends with the surrounding landscape.

E. Cultural Resources

1. If cultural resources surveys identify areas with a high probability of encountering potentially significant sub-surface sites, a qualified archaeologist will inspect excavating activities in those areas or the facility will be relocated.

2. Operators will inform their employees, contractors, and subcontractors about relevant local and federal regulations intended to protect archaeological and cultural resources. All personnel should be informed that collecting artifacts—excluding arrowheads—it is a violation of Federal law and that employees engaged in this activity will be subject to disciplinary action, which could include dismissal.

3. Equipment operators should be informed that a cultural resource could be found anywhere; and if they uncover a site during construction, surface disturbing activities in the vicinity of the site must be immediately halted and the BLM notified.

4. Should future work identify any traditional Native American religious or sacred sites, consultation among the BLM, the affected Native American group, the Wyoming SHPO and the project proponent will occur to resolve conflicts. This consultation will occur on a case-by-case basis.

F. Historical Resources

1. The limits of existing road and pipeline rights-of-way within historic trail buffers will be staked prior to installing pipelines within these areas. Project-related traffic and all construction activities will be confined within these rights-of-way to avoid impacts to historical resources.

2. To prevent contributing trail segments from being used by vehicles, operators will fence the entrance to contributing segments of the trail, where appropriate, where they intersect existing or proposed roads and pipelines. Signs on the fences should identify the need for the closure during construction and operation of operations. Operators should inform workers of the need to protect historic trails, i.e., trails should not be used as hard roads.

3. Where the eligibility of a trail is unknown an historical assessment will be conducted. If these segments are found to be contributing, no new well pads, roads, or pipeline corridors will be permitted within 1/4 mile of the trail or visual horizon of the trail, whichever is closer. Pipeline crossings of trail buffers associated with contributing segments will be confined to existing road or pipeline rights-of-way.

G. Air Quality

1. Road dust abatement practices will be implemented in accordance with Wyoming Department of Environmental Quality Air Quality Standards and Regulations, Sections 3 and 14. Roads constructed on soils susceptible to wind erosion will be surfaced (e.g., gravelized or otherwise treated) to reduce the amount of fugitive dust generated by traffic. These roads will be identified during the review and preparation of the annual transportation plans submitted to the BLM.

2. Dust suppressants will be used as necessary on unpaved local, collector or arterial roads which present a fugitive dust problem. Water and/or chemical dust suppressants will be applied to minimize TSP and PM0 dust emissions. The control efficiency of water as a suppressant is computed at 30 percent wetting at an (assumed) application rate of 0.02 gallons per square yard.

3. To reduce fugitive dust, Operators should establish and enforce speed limits for all unpaved roads in the project areas. These roads will be identified during the review and preparation of the annual transportation plans submitted to the BLM.

H. Paleontological Resources

1. If the BLM determines that paleontological resources may be of particular concern at a specific project location, a technical analysis of existing paleontological data to determine sensitivity will be required. A technical analysis consists of a literature and museum records search conducted by a qualified paleontologist and determines if a field survey is necessary.
2. BLM will require a paleontological sensitivity survey at any proposed project site within an area which BLM has determined holds a high potential for encountering paleontological resources of scientific value. The survey will be conducted by a qualified paleontologist and will consist of a literature review and search of museum records. The results of such a survey will be used to develop field survey requirements, if warranted, as well as identify environmental protection measures (measures may include avoidance, monitoring of construction, etc.).

I. Groundwater Resources

1. To further reduce the potential for impacts to shallow groundwater, the following additional mitigation and monitoring measures will be implemented:
   - Pit liners will be incorporated into the design of wells in the Green River floodplain;
   - Empty drums will not be stored at production sites;
   - If methanol is to be used at a production location, the tank will be contained within a dike or containment structure; and
   - In the Green River floodplain, closed drilling systems and solidification of reserve pits will be required.

J. Surface Water Resources

1. General Construction

   a. All water used for oil and gas development shall be obtained from sources previously approved by the Wyoming State Engineers Office. All water source staging areas associated with the Green River and its tributaries shall meet the following criteria unless otherwise required by the Authorized Officer:
      - All pumps, transports, or other mechanical devices shall be placed no closer than 100 feet from the high water line;
      - All devices containing fluid considered toxic to humans, fish, birds, or mammals shall be placed within a containment device designed to contain any spilled fluids;
      - Any release of toxic substances shall be reported to the Wyoming State Engineers Office and to the appropriate administering Federal Authorized Office immediately upon release.
   b. Water Withdrawal sites shall be gravelled where necessary. Hoses used to withdraw water should be clean and not contaminated with drilling fluids. Hoses shall not be left at the site without prior approval of the Authorized Officer. Operators will require contractors withdrawing water form the Green River or its tributaries to comply with the above criteria.
   c. Roads or pipelines will cross drainages at a right angle whenever feasible. Crossings should be constructed during periods of low flow or when the stream bed is dry. Stream banks will be returned to a stable contour and banks at the crossing stabilized, if necessary, with rip-rap.

2. Wells

   a. Where necessary to protect wetlands and waters of the U.S., well pad designs will incorporate sediment and drainage control structures. Identification of specific structures, their design and placement will be discussed in the appropriate permit application to BLM. Fuel, product or methanol tanks will be placed within a berm or other containment device as described in the SPCC Plan.
   b. Operators should inform their employees, contractors and subcontractors that any hauler found to be dumping drilling fluids into surface waters or withdrawing water from the Green River without a permit will be subject to dismissal and their actions reported to the WDEQ or WSEO.

3. Pipelines

   a. Trench dewatering and the discharge of hydrostatic test water will be conducted in compliance with WDEQ notification and permit requirements and in a manner which will minimize sedimentation and impacts to surface water. Water will be discharged to areas where it will not flow into perennial or intermittent stream channels. Silt barriers, such as hay bales or silt fences, will be incorporated into the discharge plan to intercept runoff and prevent sediment from reaching streams.

4. Roads

   a. Heavy truck traffic will not be allowed on access roads during wet periods (e.g., cause 4-inch rains and/or heavy road surface) unless the roads have been gravelled for all-season use. Construction of roads across drainages should occur only while the stream bed is dry. Culverts should be sized to allow uninhibited movement of stormwater runoff. As an alternative, equipment bridges could be used.
   b. Road maintenance responsibilities will include preventative and corrective maintenance on drainage and erosion control structures.
   c. Fuel haulers and other carriers used by operators in the project areas should be required to demonstrate that they have a DOT spill plan in place.

5. Mitigation and Monitoring To Reduce Cumulative Surface Water Impacts

   a. Measures which focus on controlling salinity and sedimentation will be implemented by the Operators within the DALLEN and Lincoln Road project areas. Also, implementation of similar measures in drainages outside the project areas may be necessary to reduce cumulative impacts within the Cumulative Impact Study Area. The BLM, with the voluntary cooperation of the Operators, will give attention to implementing measures in the basins outside the project areas. Given levels of existing disturbance and impact, priority will be given to implementing the following mitigation measures in Birch Creek, Unnamed Basin #1, and areas that directly drain into the Green River and Fontenelle Reservoir.
   - Reduce sediment transport by designing, installing and maintaining instream structures (e.g., rock check dams, rip-rap, drop structures);
   - As part of maintenance of existing roads, realign and maintain natural drainage patterns, maintain or install structures (e.g., sediment traps in road ditches) which will reduce sediment transport from road ditches into drainages;
   - Improve infiltration and/or reduce sediment and runoff from existing well pads by graveling;
   - Reclaim roads within the canyons or roads adjacent to drainages which are not needed to serve existing oil and gas production sites or livestock grazing administration;
   - Conduct follow-up reclamation on existing sites where reclamation success does not meet current standards; and
   - Monitor these drainages to determine whether sediment transport and salinity levels in waters have been reduced. If levels have not been reduced, reevaluate the erosion control program within these drainages and modify as necessary.

K. Floodplains

1. To protect surface water and shallow groundwater within floodplains, reserve pits in floodplains will be lined and bermed. A closed or semi-closed mud system will be used in these areas. To speed removal of drilling fluids, pits in floodplains will be dewatered upon the completion drilling.

2. Surface pipelines or tanks will not be placed in floodplains. However, should this occur, surface pipelines and tanks in floodplains will be anchored to prevent their shifting or breaking loose in the event of a flood. Subsurface pipelines in floodplains will be buried below stream scour depth. Roads in floodplains will be constructed with culverts adequate to convey floodwaters and to minimize flooding and pooling of floodwaters. BLM lack authority to require implementation of those measures at locations within the floodplain that involve private or state land and minerals.
L. Soil Resources

1. Erosion Control, Revegetation and Restoration Plans (ERRP) are synonymous with the intent of the WDEQ Storm Water Pollution Prevention Plan (SPPP). An ERRP will be developed for each project area or each AFD, ROW, etc. The ERRP will identify the following sensitive or problematic soil conditions on a site-specific basis and identify measures which will minimize impacts to those soils: 1) soils on steep slopes; 2) erosive soils; 3) saline and/or sodic soils; 4) soils with a low reclamation potential; and 5) soils on floodplains or with high water tables. The ERRPs should address topics outlined in Appendix G of this ROD. The ERRPs will be included in the submission for each well site unless the location of other wells, roads and pipelines have been finalized and they can be included in a single plan. The following potential conditions will be considered and addressed in the ERRP:

a. Steep slopes - While the location of well pads on steep slopes will be avoided by implementing the RPA, final alignments of road and pipeline routes should be examined in the field to ensure that construction on steep slopes is avoided to the extent feasible. Where construction cannot avoid disturbance to these areas detailed engineering designs and reclamation plans will be prepared and approved by the BLM to ensure cut and fill slopes will be minimized, slopes will be stable and erosion will be minimized. Details of drainage design plans will be required on roads constructed on these slopes to ensure that runoff is adequately controlled and conveyed, and appropriate best management practices (BMPs) are installed to prevent sedimentation.

b. Sand Dunes - Although the RPA indicates which well pads should be verified to avoid disturbance to these dune deposits, it may not be possible to completely avoid dune deposits during road and pipeline construction. In such cases the following mitigation measures will be implemented:

- Pipelines will be laid on the surface to reduce disturbance to the dunes;
- Snow fences will be used in dune deposits in the Lincoln Road-Wyoming Area as necessary to help stabilize disturbed areas; and
- Seeding will be conducted with a mixture developed for these sites and mulch applied at a rate of 2 to 4 tons per acre.

c. Saline and sodic soils - While impacts to saline and/or sodic soils are indirectly reduced by the RPA, additional mitigation measures necessary to reduce impacts which may occur from disturbing these soils will include:

- Use well pad designs which may include sediment traps at discharge sites to prevent any down stream movement of sediments (see Appendix G examples of possible erosion controls for well pads);
- Where roads are constructed on these soils adjacent to streams, road surface is critical to reduce sediment transport into stream channels. In addition, appropriate BMPs should be installed to prevent sediment transport (see Appendix G BMP examples); and
- Use the plant species adapted to these conditions to enhance revegetation success.

d. Soils with a low reclamation potential - Mitigation measure necessary to minimize impacts to these soils and to enhance revegetation success will include:

- Minimizing disturbance to the smallest area necessary to safely construct the project;
- Ensuring that topsoil is salvaged for use in reclamation areas;
- Identification of vegetation types and soil factors in the ERRP which will affect revegetation so that use of proper seed mixture can be evaluated;
- Ensuring that the proper revegetation procedures are used (e.g., scarification, seedbed preparation, seeding methods and seeding dates);
- Mulch disturbed areas with 2 tons per acre where appropriate or return cleared vegetation to reclaimed areas to conserve soil moisture; and
- Monitor soils to ensure adequate vegetation is established.

e. Soils with a high water table - Mitigation measures necessary to reduce impacts to these soils include, if required as a result of BLM on-site examination:

- Delaying construction until the dry periods;
- Conducting soils tests where necessary to ensure that road and well pad design incorporates base materials sufficient to support traffic and well pad loads.

f. Use of geotextile fabrics, where necessary, to support the road base;
- Lining reserve pits; and
- Conduct drilling using a closed mud system.

2. Best Management Practices

The ERRP should identify the site-specific design, use and location of BMPs such as those described below.

a. Well pad designs - Where appropriate, well pad designs will ensure that off-site runoff is diverted around the well pad by berms or ditches (see Appendix G). This should minimize off-site runoff from flowing onto and accumulating on well pads. Well pads will be designed to have zero runoff from the pad at least until the reclaimed areas have been stabilized. Runoff will be diverted into one of the following: 1) a reserve pit sized to contain drilling fluids and cuttings along with runoff from the pad from a minimum of the 10-year 24-hour storm event; or 2) a separate containment pit where runoff should be allowed to evaporate or infiltrate. Infiltration should only be considered if measures are taken to ensure that runoff is not contaminated. Fill slopes should also have a containment berm on the bottom of the slope to control sediment from the fill slopes and prevent sediment transport. This is especially important near intermittent and perennial streams and on steep slopes. Where zero runoff is not feasible from well pads, drainage from these pads will be designed to be directed to a sediment trap or basin to capture sediment.

b. Interim reclamation - During interim reclamation on producing locations, the well pad will be reclaimed to a contour as soon as possible to the original contours. Cut and fill slopes will be reduced to a 3:1 slope or less where feasible. In those areas where slopes cannot be reduced they will be graded to the gentilest slope possible and revegetated for erosion control. Terraces or serration (steps) will be used as necessary to shorten slope lengths.

c. Producing locations - To avoid contamination and water quality degradation downstream, producing locations will approach zero runoff until adjacent disturbed areas are stabilized. All unused portions of the producing location should be reseeded with topsoil and revegetated according to the procedures outlined in this Section.

d. Road designs - Road widths and designs will meet BLM standards (BLM Manual 9113). Road surfacing requirements will be based on soil sampling. Excessive road widths will be avoided. Roads are likely to be the largest contributor of sediment in the Cumulative Impact Study Area; therefore, road drainage must be designed on a site-specific basis. Natural drainages will not be interrupted and adequate cross drains spacing and sizing will be installed to prevent sedimentation. Rip-rap will be installed at the inlet and outlet of all culvert installations.

e. Gathering Pipelines - The clearing of pipeline rights-of-way will be accomplished with the least amount of disturbance to vegetation and topsoil—such as by scalping vegetation on surface and leaving root systems intact. Topsoil salvaging will occur on all areas where grading is required. Where topsoil salvaging occurs, it will be wind-rowed on the edge of the right-of-way and will not be allowed to mix with trench spoil. Trench backfill should not extend above the original ground level after the fill has settled. Waterbars will be installed in sloping terrain. Bladed vegetation materials will be respread over the disturbed area once construction is complete. Reclamation may be required on soils with no reclamation potential. Banks of stream crossing will be returned to there approximate original contour or shaped to minimize erosion. Silt fences or other sediment barriers will be installed where necessary at stream crossing to prevent sedimentation. These areas may be fenced to reduce grazing and ensure reclamation success.

f. Surface Pipeline - Throughout the Cumulative Impact Study Area, surface pipelines will be used where pipelines cross steep slopes (greater than 25 percent) or in sandy soils areas.

g. Sediment controls - Typical sediment control BMPs designs (i.e., silt fences, waterbars, loose rock check dams) are provided in Appendix G. During development of the ERRPs these and other appropriate structures will be included in the plans. The ERRPs will discuss monitoring and maintenance requirements of these structures.
3. Revegetation and Reclamation Measures

The following describes how reclamation procedures will be implemented:

a. Scarification - Prior to revegetation all compacted surfaces need to be scarified by ripping or chiseling to loosen compacted soils. Scarification will promote water infiltration, better soil aeration and root penetration. Scarification should be done when soils are dry to promote shattering of compacted soil layers.

b. Seedbed Preparation - Proper seedbed preparation is critical for seed establishment. Seedbed preparation will be conducted immediately prior to seeding to prepare a firm seedbed conducive to providing seed with sufficient moisture retention. Seedbed preparation is performed to break up surface crusts and to eliminate weeds which may have developed between final tilling and seeding. In most cases, chisel plowing is sufficient since it leaves a surface smooth enough to accommodate a drill seeder pulled by a farm tractor and rough enough to catch broadcast seed and trap moisture and runoff.

c. Seed Mixtures - Seed mixtures will be specified on a site-specific basis and their selection will be justified in the EIRP in terms of local vegetation and soil conditions. Executive Order 11987 provides guidance in choosing species for seed mix. This Executive Order restricts the use of introduced species on public lands in order to reduce harmful effects of exotics and maintain biodiversity. Recommended seed mixtures (one for the general area, one for sandy sites, and one for saline/sodic soils) are listed in Section IV, Tables IV-3, IV-4, and IV-5. These seed mixtures were developed from the Buckhorn Revegetation Study Plot which is located in Section 12, T. 25 N., R. 111 W. and adheres to Executive Order 11987.

Other native species which should be considered include: bluebunch wheatgrass, streambank wheatgrass, bottlebrush sapphirewillow, and big sagebrush. Introduced species which did well in the study plot should be considered if native species reclamation is unsuccessful. In this general mixture include: Mandan pubeaceous wheatgrass, Oase intermediate wheatgrass, and Ephraim crested wheatgrass. Use of any introduced species should be approved by the BLM prior to seeding.

d. Seeding Schedule - Fall seeding should occur from about October 1 to November 15th or up to ground freeze or snow pack which prevents critical seed soil coverage. Spring seeding could also occur (if approved by the BLM) as soon after ground thaw as possible without significantly compacting or rotting soils. Spring seeding should be completed by May 1.

e. Seeding Method - Seeding should occur by broadcasting seed onto a rough seedbed and then lightly harrowed, chiseld, or raked to cover the seed. The seeding rate will be doubled when broadcasting the recommended seed mixtures since these mixtures where developed for drill seeding. The method used to cover the broadcast seed should be selected so that the seed is lightly covered but maintains the surface in a rough condition. The broadcast seeder should be properly calibrated or the rough seedbed should be selected so that the proper seeding rate is applied.

Drill seeding could be used where the terrain is accessible by equipment. During drilling the seed should be planted to a depth between 1/4 to 1/2 inches. To prevent seed from separating due to their sizes and weights during drilling, the seed should be separated by boxes and rich hulls should be added to the seed as necessary to prevent separation. The drill should be properly calibrated so that seed is distributed according to the rates specified for each seed mix.

f. Mulching - Where mulching is deemed necessary a certified weed-free or any mulch which will not crimp into the soil at an application rate of 2 to 4 tons per acre. Mulches may be applied by blowers, spreaders or by hand. The mulch should not be finely shredded during application and mulch should be at least 2 inches in length and be enough to be anchored by crimping. The mulch should be spread uniformly over the area so that 75 percent or more of the surface is covered. Mulch will be crimped to a depth of 2 to 3 inches.

g. Maintenance - Inspections of the revegetation efforts will be conducted after the second and fourth growing seasons to evaluate success. The need to reseed, fertilize or spot treat will be determined by the operator and the BLM. Successful revegetation will be based on the ability of the vegetation to stabilize reclaimed sites and to provide livestock and wildlife forage. If reseeding is judged to be necessary based on vegetation density and composition of adjacent areas, the EIRPs should be reviewed for any necessary changes to improve revegetation success.

If noxious weeds infest disturbed sites they will be controlled by mechanical, chemical, biological, or other methods which are approved by BLM and the local weed control agency. Herbicide use will be avoided in all areas near water and Special Status Plant Populations.

M. Grazing Resources

1. Operators considering reclamation of roads and two-tracks not needed for oil and gas production, will first consider that some of these roads and two-tracks are used by livestock holders and should remain open for that purpose. Roads and two-tracks are undergoing reclamation will be fenced if livestock concentrate in these areas. The need for fencing will be determined by BLM after the second growing season.

2. BLM may establish study plots and enclosures on reclaimed areas to help determine whether existing levels of livestock grazing are having a detrimental effect on reclamation of construction-related disturbance in the project area.

N. Special Status Species (Threatened, Endangered, and Candidate)

1. In addition to environmental protection measures incorporated into the RPA that will minimize or eliminate impacts to Federally-listed threatened and endangered species and/or candidate species, the following measures will further reduce the potential for impacts to these species. Several of these measures were suggested by respondents during scoping or have been incorporated into previous NEPA documents completed by the BLM.

o Oil and gas operators should inform their employees, contractors and subcontractors of Federal and State laws, regulations, and policies that pertain to protection of threatened and endangered species, candidate species and sensitive species. Failure of employees, contractors, and subcontractors to adhere to State and Federal game laws as a condition of employment could be grounds for dismissal.

o To minimize poaching, oil and gas operators should inform their employees, contractors, and subcontractors that firearms should be forbidden at work sites;

o Similar to other projects in the BLM administrative areas, all operators should adopt a policy of prohibiting dogs at work sites to reduce the potential for harassment of wildlife;

o As part of their transportation plans, oil and gas operators will identify: 1) unneeded roads and two-tracks that will be closed in coordination with BLM; and, 2) roads that will be closed to limit access to habitat utilized by wintering bald eagles;

o Where project sites will be located in potentially suitable habitat, there must be a strategy to determine whether the area is being used for nesting by raptors or other sensitive species (e.g., ferruginous hawks, burrowing owls, loggerhead shrikes). Surface disturbance activities are restricted during the nesting period (see Section III, Table III-1, Seasonal Restrictions For All Surface Disturbance Activities). If nesting loggerhead shrikes or burrowing owls are found, no activities will occur in the utilized habitat during the reproductive period—February 1 through July 31. Likewise, no permanent above ground project component will be located within 825 feet of any raptor nest structure judged to be suitable for future use by raptors, with the exception of eagle nests for which the distance is 1,970 feet;

o Surveys to locate bald eagle roost trees, perch sites and feeding areas along the Green River will be conducted to ensure that appropriate mitigation measures (buffer areas, scheduling, etc.) are being implemented;

o No potential nest trees for bald eagles or other raptors will be removed during project activities in the Green River floodplain; and

o If plovers are found to be nesting or rearing broods on a site planned for development, the project component will be moved to avoid impacts to mountain plovers. If necessary, operators will minimize impacts on plover nesting activities to avoid the late March through July nesting period.
O. Wildlife Resources

1. BLM Standard Stipulations attached to each APD will limit impacts to wintering big game, sage grouse on leks and nesting raptors. In order to effectively implement these stipulations as mitigation measures, surveys for sage grouse leks and raptor nest sites within the project area and the buffer specified in Section III, Table III-1, Seasonal Restrictions For All Surface Disturbance Activities will be required. In addition, the following mitigation measures will reduce impacts that could occur under Fontenelle Projects

- To minimize poaching, the Operators could provide all project-related personnel with information about State and Federal game laws. The Operators and their contractors could adopt a policy of prohibiting firearms at work sites.
- The Operators could work with WGDG on a program to offer a reward for information leading to the arrest of poachers.
- Similar to other projects in the BLM’s Rock Springs District, the Operators and their contractors should adopt a policy of prohibiting dogs a work sites to reduce harassment of wildlife.
- The Operators and their contractors should adopt a policy of limiting all post-construction project traffic to roads specifically identified for access to project sites. Project-related traffic should be excluded on all other existing roads in the project area.

2. In cooperation with BLM and other federal, state, and local agencies, in the preparation of the wildlife protection and impact mitigation plan (Appendix E), the Operators will:

- Develop a transportation plan that will identify roads that will be closed to the public, especially during winter and spring. Wildlife habitat models for mule deer winter range habitat and sage grouse nesting habitat could be utilized to identify areas that will most benefit by road closure during the respective seasons.
- Identify company constructed and unnecessary roads within their project area that could be reclaimed and where abandoned well pads and other well-field facilities have not been adequately reclaimed. Wildlife habitat models (pronghorn summer habitat, mule deer winter habitat, sage grouse nesting habitat) could be used to identify and prioritize areas that will most benefit from renewed reclamation;
- Identify where newly constructed and existing roads within their transportation network will intersect two-track roads and provide barriers where these two-track roads intersect the Operators’ existing and proposed roads;
- Fence reclaimed sites where impact from cattle and sheep grazing will preclude successful revegetation;
- Evaluate existing stock ponds within the project areas and make improvements, where necessary, so they will remain water for use by wildlife and livestock. Improvements could include reconstruction of dams and installing snow fences within stock pond drainages to increase potential water source. Wildlife habitat models (pronghorn summer habitat, sage grouse nesting habitat) could be used to identify and prioritize areas where stock pond improvements will be most beneficial;
- Consider constructing wildlife overpasses within key sage grouse nesting habitats and key pronghorn summer range habitats that will be fenced to prevent livestock use. Wildlife habitat models (pronghorn summer habitat, sage grouse nesting habitat) could be used to identify and prioritize areas that will most benefit from new water sources;
- Consider drilling water wells for wildlife use. Wells will have capabilities for seasonal function so that they will not retain wildlife on inappropriate seasonal ranges. Wildlife habitat models (pronghorn summer habitat, sage grouse nesting habitat) could be used to identify and prioritize areas that will most benefit from new water sources;
- Control fugitive dust, following Wyoming Air Quality Standards and Regulations (1989, Section 14), during road and well pad construction and surface roads to prevent dust during operations;
- Within big game winter ranges, consider confining well site visits to mid-day (10 am to 3 pm) during winter (November 15 to April 30) to avoid disrupting big game during principal feeding periods;
- Consider not placing roads and constructing well pads in sage grouse nesting habitats with high probabilities of suitability, primarily high density sagebrush within 8 miles of a known sage grouse lek;
- Consider constructing nesting structures for use by ferruginous hawks and golden eagles in areas where no suitable nesting substrates are present and in which no construction activities will occur; and
- Reserve pits will be flagged between completion of drilling and dewatering of the pit. In situations and at locations to be specified by BLM, reserve pits will be covered by nesting if they present a threat to migratory waterfowl.

P. Health and Safety

1. Safety practices associated with drilling and servicing of wells are specified and regulated by the Wyoming Occupational Health and Safety Commission.

2. The Operators will comply with all applicable reporting requirements during construction and operations as required under the EPA’s Consolidated List of Chemicals Subject to Reporting under Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 (as amended). The Operators will comply with the requirements of the EPA List of Extremely Hazardous Substances and Their Threshold Planning Quantities as defined in 40 CFR 355. No reportable quantities of extremely hazardous substances, as defined by 40 CFR 355, are expected to be used during construction or operations.

3. The Operators and their contractors will comply with all applicable Federal laws and regulations; this includes laws and regulations related to the handling and reporting of hazardous materials. Use, handling, storage, and disposal of materials subject to SARA Title III reporting are addressed in the Materials Safety Data Sheets which DALEN and the Lincoln Road Operators will maintain at their respective field offices.

4. In compliance with Federal regulations (e.g., 40 CFR 112), each Operator will prepare and display upon request by the Authorized Officer a Spill Prevention Control and Countermeasure (SPCC) plan. The plan will address preventive systems as well as contingency measures that will be in place to control a spill. The intent of the SPCC plan will be to prevent an accidental discharge of fuels or other pollutants from reaching surface waters or other environmentally sensitive areas.

5. BLM On-Shore Order No. 2 (Federal Register, November 18, 1988) requires that a blowout preventer (BOP) be installed, used and maintained and tested to ensure well control. An APD for each proposed well will address expected pressures and specify the type of BOP which will be installed. APDs will be reviewed and approved by BLM and/or the WOGCC before drilling is allowed to commence.
SECTION V: PROCEDURES FOR PROCESSING APPLICATIONS IN AREAS OF SEASONAL RESTRICTION

Procedure For Processing Applications

Upon receipt of an application, the project location is reviewed by BLM against the resource management plan (RMP) to determine conformance with the plan and to identify existing resource concerns in the project area. An APD is posted for 30 days for public review.

BLM will then conduct the following:

Gather existing National Environmental Policy Act (NEPA) documents pertinent to the proposal or the project area;

Review the proposal against existing environmental documents and the RMP to determine whether existing documentation is adequate;

If existing documentation is adequate, prepare an Administrative Determination (AD) including appropriate mitigation measures (see Wyoming Instruction Memorandum WY-90-346);

If existing documentation is insufficient or nonexistent, prepare NEPA documentation as needed using appropriate format (see BLM NEPA Handbook, H-1790-1); and

Issue a decision on the application consistent with the AD or tiered NEPA document as appropriate.

NOTE: In seasonally crucial wildlife habitat, an approved APD will generally include a seasonal Condition of Approval (COA) because (1) the APD is valid for one year from date of issuance and BLM does not control the start-up date for project activity; and (2) field conditions during the crucial period cannot be predicted at the time of APD approval.

If a seasonally restrictive COA is needed because a lease contains no such stipulation, the decision whether to impose the restriction must also consider the reasonableness of the restriction relative to the operator's ability to exercise the benefits of the lease (43 CFR 3101.1-2). The need for a COA must be documented in a site specific EA or EIS, if necessary. This analysis must provide clear and convincing evidence showing undue and unnecessary degradation would result if the COA were not applied.

Procedure For Processing Requests For Exception From Seasonal Stipulations and/or Conditions of Approval

An exception is a one time, case-by-case exemption from a lease stipulation or a condition of approval. The stipulation or condition of approval continues to apply to all other sites within the leasehold to which the restrictive criteria applies. A request for exception must be initiated in writing by the operator. This may be done concurrently with submission of an application (typical for situations involving lease stipulations), or subsequent to permit approval (in the case of COAs attached to approved permit).

When requested concurrently with an application, the exception from a stipulation or from a COA is considered as part of the project proposal in RMP and NEPA compliance review.

For separate requests, the request is considered as a unique action and is analyzed and documented individually for RMP and NEPA compliance.

In both cases, processing includes coordination with Wyoming Game and Fish Department (WGF) for seasonal wildlife-based lease stipulations or permit COAs.

The unpredictability of weather, animal movement and condition, etc., preclude analysis of requests related to wildlife far in advance of the time periods in question.

Analyses of requests include review of potential mitigation measures and alternatives (traffic restrictions, alternative scheduling, staged activity, etc.).

Criteria For Considering Exceptions To Seasonally Restricted Activity

Land use activities may be authorized with a seasonal restriction(s), "no surface occupancy" or a distance restriction for sensitive and crucial habitats.

Stipulations were developed to provide protection of natural resources. Protective wildlife seasonal stipulations are developed consistent with statewide dates. For example, big game crucial winter ranges are protected from November 15 through April 30. This restriction is not intended to close an area to development but is in place to protect big game if weather or other habitat needs dictate that it is necessary.

Over the past few years the public has received the impression that crucial winter ranges are off limits to any activity. This is true only when conditions dictate. The BLM can and does grant exceptions to seasonal restrictions if the wildlife biologist, in consultation with the Wyoming Game and Fish Department, feels that granting an exception will not jeopardize the population being protected. Wildlife biologists use a set of criteria when considering a request for an exception. Professional judgment plays a key part in the Bureau's biologist's recommendation to the Area Manager to grant or not grant exception(s). There is no clear cut formula.

Big Game Winter Ranges

The criteria used for delineating crucial big game winter range are those areas available, relatively intact, and that winter most of the population at its objective in adequate body condition, eight or more years out of ten. The most crucial time period for these animals is usually from January 1 through March 15, and this time period is when the stipulation dates are generally enforced. However, the remaining time frames of the standard statewide stipulation allows the authorizing officer the option to enforce a longer seasonal restriction if winter conditions warrant.

A. General Considerations Regarding a Request For Exception

- Are the factors leading to the inclusion of the wildlife seasonal restriction still valid?

- Is the request for an exception from a lease stipulation or is it for relief from a condition of approval on an application (e.g., APD, SN, ROW)?

- What are the dates for the proposed exception/relief?

B. Criteria to Consider For Granting Exceptions on Winter Ranges:

1. Animal presence or absence

2. Animal condition

3. Weather severity

- snow conditions (depth, crust, longevity)
- seasonal weather patterns
- wind chill factors (indication of animal's energy use)
- air temperatures & variation
- duration of condition
- forecasts - long range for duration of winter

4. Habitat Condition and Availability

- animal density, high or low
- forage condition, good or poor
- competition - livestock/other wildlife
- forage availability
- amount of forage
- snow depth
- has livestock use decreased available winter forage
- is there suitable and ample forage immediately available and accessible nearby that is not being used

5. Site Location

- likelihood of animals habituating to activity
- presence of thermal cover, wind cover, etc.
- what proportion of winter range is affected
- where is the site located within the winter range
- is there other activity in the area and is this activity likely to increase the cumulative adverse impact

6. Timing

- early in winter season
- near end of winter season
- what kind and length of disruptive activity is expected
- how much of the winter is remaining when activity is likely to occur
General Considerations for Granting Exceptions to Stipulations

Elk
- Short-term exceptions are more likely to be considered early (November 15 - December 1) and late (April 1 - April 30) in the winter season, depending on weather conditions and animal occupancy. Exceptions would not be granted if requested from December 1 - March 1 unless unusually mild winter conditions prevail. Exceptions in elk calving areas (May 1 - June 30) dates will not be granted due to elk sensitivity to disturbance. Displacement in open habitats is much greater than woodlots or forests, hence restricted areas will encompass larger areas in open habitat.

Moose
- Exceptions will depend on weather conditions and presence of animals.
- Moose habitat is given protection through riparian and stream buffer zone stipulations (500 feet from live water and riparian habitat).

Antelope
- Exceptions will generally be granted except where physical barriers (e.g., highways, fences, rivers, canyons, etc.) limit animals ability to move into other suitable habitats. In the case of developing oil and gas fields with proposed intensive or disruptive disturbances, BLM and WQFD coordination will be required to assure that cumulative disturbance and/or range competition with other big game and livestock will not affect herd unit objectives. Exceptions to restrictions will be closely watched during severe winters when antelope movement is restricted.

Deer
- Short-term exceptions may be granted early (November 15 - December 1) and late (April 1 - April 30) depending on weather conditions and animal occupancy, using the previously discussed criteria. Exceptions can be granted for north slopes, deep snow areas or other habitats within crucial ranges which preclude use by wintering deer and in which access roads are determined to have little adverse impact.

Raptors
- The "no surface occupancy" stipulation of February 1 to July 31, within 1/2 or 1 mile of raptor nests can be shortened, depending on nesting chronology of individual species, nest site location, and topography. Inactive nests can be excepted, as may certain types of short-term, minor disruption land use activities which are not anticipated to affect nesting success.

Sage Grouse
A "controlled surface use" stipulation will be applied to a 1/4 mile radius of active sage grouse strutting grounds to include no aboveground facilities (power lines, storage tanks, fences, etc.). Linear disturbances such as, pipelines, seismic activity, etc., could be granted exceptions. A "controlled surface use" stipulation will be applied from February 1 through May 15, within 1/4 mile radius of active strutting grounds from 6 p.m. to 9 a.m. daily. The actual timing of this stipulation can be modified by weather conditions such as fog and cloudy conditions, or clear, bright moonlight nights. Seasonal restrictions would be applied through July 31, within an additional 1.75-mile radius from leks to protect sage grouse nesting habitat. Areas within that radius not used for nesting can be excepted, provided actual nesting areas are not affected.

The final determination for granting an exception to wildlife stipulations will be a decision by the Bureau of Land Management after consultation with the Wyoming Game and Fish Department.

These procedures will be utilized for any request for exception for a surface disturbing or disruptive activity.

SECTION VI: METHODS OF PROTECTION OF GROUNDWATER DURING DRILLING AND ABANDONMENT OPERATIONS

Drilling Wells
When processing an APD, the BLM geologist must identify the maximum depth of usable water as defined in Onshore Oil and Gas Order No. 2. Usable water is defined as that water containing 10,000 parts per million or less of total dissolved solids. Zones containing water of this quality shall be isolated.

Determining the depth to freshwater requires specific water quality data in the vicinity of the proposed well or the use of electric logs from nearby wells. If water quality data or logs from nearby wells are not available, the area within a 2-mile radius of the proposed well is checked for water wells. If freshwater is identified, surface casing is required to be set below the deepest freshwater zones found. If usable water is found at a depth that is too deep to set surface casing, the operator is required to isolate those zones.

Plugging and Abandonment of Wells
The purpose of plugging a well at the time of abandonment is to prevent fluid migration between zones, to protect minerals from damage, and to reclaim the surface area. Each well must be handled individually due to a combination of factors including geology, well design limitations, and specific rehabilitation concerns. Therefore, only general requirements can be established, and these general standards will be modified for each individual well.

The first step in the plugging and abandonment process must be the filing of a Notice of Intent to Abandon (NIA). Verbal plugging instructions can be given for plugging current drilling operations, but a Subsequent Report of Abandonment (SRA) must be filed after the work is completed.

In open hole situations, cement plugs must extend at least 50 feet above and below zones: with fluid (oil, gas, water) which may migrate; of lost circulation (this type of zone may require an alternate method to isolate); and of potentially valuable minerals. Thick zones may be isolated using 100-foot plugs across the top and bottom of the zone. In the absence of productive zones and minerals, long sections of open hole may be plugged with 150-foot plugs placed every 2,500 feet. In cased holes, cement plugs must be placed opposite perforations and must extend 50 feet above and below perforations except where limited by plug back depth. It is also acceptable, in cased holes, to cement squeeze the perforations through a cement retainer placed above the perforations and leave approximately 50 feet of cement on top of the retainer. All cement plugs shall consist of an additional 10 percent per 1,000 foot of depth to compensate for contamination.
SECTION VII: MATERIALS UTILIZED IN THE FONTENELLE PROJECT AREAS WHICH MAY CONTAIN POTENTIALLY HAZARDOUS SUBSTANCES

BLM policy (Instruction Memorandum 93-344, 9/9/1993) on hazardous materials requires identification of the following:

(A) any chemical or chemicals from the Environmental Protection Agency’s Consolidated List of Chemicals Subject to Reporting Under Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 (as amended) to identify any hazardous substances proposed for use in this project, as well as the EPA’s List of Extremely Hazardous Substances as defined in 40 CFR 355, as amended. Substances included on either of these lists that would be used in this project are listed in Table VII-1 (Potentially Hazardous Materials Typically Used for Proposed Drilling, Completion and Production Activities).

The Fontenelle Operators and their contractors will be required to comply with all applicable federal laws and regulations existing or hereafter enacted or promulgated. The Fontenelle Operators and their contractors will locate, handle, and store hazardous substances in an appropriate manner that prevents them from contaminating soil and water resources or otherwise sensitive environments. Any release of hazardous substances (leaks, spills, etc.) in excess of the reportable quantity as established by 40 CFR 117 will be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended. If the release of a hazardous substance in a reportable quantity occurs, a copy of the report will be furnished to the BLM AG and all other appropriate federal and state agencies.

A list of potentially hazardous materials which could be used in well drilling, completion, and production activities is described in Table VII-1. The table also includes potentially hazardous materials—mainly fuels, lubricants and hydraulic fluid—which would be used in related construction activities such as road building.

The Fontenelle Operators will maintain files containing current Material Safety Data Sheets (MSDS) for all chemicals, compounds, and/or substances which are used during the course of construction, drilling, completion, and production operations in the project areas. The Operators have reviewed the Environmental Protection Agency’s (EPA’s) Consolidated List of Chemicals Subject to Reporting Under Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 (as amended) to identify any hazardous substances proposed for use in this project, as well as the EPA’s List of Extremely Hazardous Substances as defined in 40 CFR 355, as amended. Substances included on either of these lists that would be used in this project are listed in Table VII-1 (Potentially Hazardous Materials Typically Used for Proposed Drilling, Completion and Production Activities).
## Table VII-1

| Material         | Use            | Hazardous Chemicals
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<tr>
<td>Propane</td>
<td>Fuel</td>
<td>None, RCRA ignitability, None</td>
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</table>

**Notes:**

1. As listed by the U.S. Environmental Protection Agency Consolidated List of Chemicals Subject to Reporting Under Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986, as amended.
2. As defined under the U.S. Environmental Protection Agency Consolidated List of Chemicals Subject to Reporting Under Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986, as amended or from RCRA wastes exhibiting the characteristics of ignitability, corrosivity, reactivity or EP toxicity.
3. As defined by 40 CFR 351.
**Environmental Assessment (EA), FONSI/DR Short Form**

**UNITED STATES DEPARTMENT OF THE INTERIOR**
**BUREAU OF LAND MANAGEMENT**
**Wyoming State Office**

**EA Number:**

**BLM Officer:** __________

**Location of Proposed Action:** __________

**Applicant:**

**Conformance with Applicable Land Use Plan:**

This proposed action is subject to the following land use plan:

**Name of Plan:**

**Date Approved:**

This plan has been reviewed to determine if the proposed action conforms with the land use plan terms and conditions as required by 43 CFR 1610.5.

**Remark:**

**Need for Proposed Action:**

**Description of Proposed Action (include mitigation required by policy, BLM manuals and the applicable Land Use Plan):**

**Environmental Impacts:**

<table>
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<th>Critical Element</th>
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<th>Affect</th>
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**Description of Impacts (Quantitative):**

**FINDING OF NO SIGNIFICANT IMPACT/DECISION RECORD.**

I have determined that the proposed project is in conformance with the approved land use plan. I have reviewed this environmental assessment including the analysis of potentially significant environmental impacts. I have determined that the proposed action with the mitigation measures described below will not have any significant impacts on the human environment and that an EIS is not required. It is my decision to implement the project with the mitigation measures identified below.

**Authority Official:** __________________ Date: __________________

**Mitigation Measures/Remarks:**

<table>
<thead>
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</thead>
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APPENDIX C
LINCOLN ROAD OPERATORS
ROAD DEVELOPMENT PLAN
FOR THE
LINCOLN ROAD AREA

Prepared By:
D.R. Griffin and Associates, Inc.
in consultation with the
Bureau of Land Management, Rock Springs District
(April 10, 1996)
## ROAD DEVELOPMENT PLAN FOR THE LINCOLN ROAD AREA

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</tr>
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### PURPOSE

This document is intended by the Lincoln Road 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 Lincoln Road 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 Lincoln Road Operators to meet their operational needs and Bureau of Land Management requirements for road standards, safety, and resource protection.

### GENERAL

Lincoln Road Operators utilize an extensive road network in the Lincoln Road Area, much of which is shared with other road users. Planned expansion of 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, Lincoln Road Operators propose to implement a quality control and assurance program for roads. This program will allow Lincoln Road 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 Lincoln Road Operators' priorities within the Lincoln Road Area. Lincoln Road 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 Lincoln Road 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 Lincoln Road 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 follows:

LEVEL 1 - TRANSPORTATION PLAN

The Transportation Plan for the Lincoln Road 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 Lincoln Road Operators in the Lincoln Road Area.

Planning

Transportation issues relating to the Lincoln Road Area are also addressed in Chapter 2 of the Fontenelle Natural Gas Infill Drilling Projects Environmental Impact Statement. That chapter, which is broad in scope and recognizes the overall needs and effects of the Lincoln Road Operators' proposed operations within the Lincoln Road Area, addresses major arterial routes (state and county routes) which will be used to reach the area. It discusses some BLM administered Collector and Local (BLM functional classification) roads which will be used to reach areas of the field, as well as the environmental effects of the construction and surface disturbances related to roads in the field(s). An estimate of traffic associated with the development of the Lincoln Road Area which will use these roads is also included in the environmental effects discussion.

The general "Existing Transportation System" map (see page 9) displays existing main routes (state, county and BLM administered roads) presently used for access in or near the Lincoln Road Area. These, as well as other field roads and proposed roads needed for field development, will be studied by the Lincoln Road Operators to determine which routes should be designated as Collector, Local and Resource (BLM functional classification) routes to form a usable 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 fields will lead to development of recreational or home sites on private land parcels near or within the Lincoln Road Area. While this is a remote possibility because the Lincoln Road Area is comprised mainly of public lands, acquired or withdrawn lands under Bureau of Reclamation jurisdiction and state-owned lands, there are some private lands adjacent to the area. If they were to be developed for recreational or home sites, short segments of field roads on public lands could become the primary access. Coordination between the BLM and counties concerning jurisdiction 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 abandonment will be accomplished by the Lincoln Road Operators during the expansion of their operations within the Lincoln Road 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 required to meet county/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 Lincoln Road 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 Lincoln Road Area will be prepared each year in conjunction with the Lincoln Road 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 Lincoln Road Area where operations are planned for the following year. Roads scheduled for abandonment within the Lincoln Road Area will also be shown on the plan. Changes in access routes (both proposed and already constructed) necessitated by terrain, environmental factors and for 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 Lincoln Road 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 the company 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, Lincoln Road 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, and the 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 Lincoln Road Area will be to the standards derived from BLM Manual 9113. The Lincoln Road Operators will use the road standards shown on the following page in the Lincoln Road 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 LINCOLN ROAD AREA

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<thead>
<tr>
<th>DESIGN ELEMENT</th>
<th>Resource Road</th>
<th>Local Road</th>
<th>Collector Road</th>
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<tr>
<td>Design Speed</td>
<td>20 MPH (max.)</td>
<td>30 MPH</td>
<td>40 MPH</td>
</tr>
<tr>
<td>Width (travelled way)</td>
<td>14 ft.*</td>
<td>20 ft. (min.)</td>
<td>24 ft. (min.)</td>
</tr>
<tr>
<td>Width (subgrade)</td>
<td>18 ft.</td>
<td>24 ft. (min.)</td>
<td>28 ft. (min.)</td>
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<tr>
<td>Minimum Hor. Curve Rad.</td>
<td>220 ft.</td>
<td>460 ft.</td>
<td>820 ft.</td>
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<tr>
<td>Maximum Grade</td>
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<td>8%</td>
<td>8%</td>
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<tr>
<td>Minimum Grade</td>
<td>0.5%</td>
<td>0.5%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Minimum Stopping Sight</td>
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<td>225 ft.</td>
<td>325 ft.</td>
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<td>Distance</td>
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<tr>
<td>Minimum Intersection</td>
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<td>300 ft.</td>
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<td>Sight Distance</td>
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<tr>
<td>slopes will increase</td>
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<td>the R/W width needed)</td>
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<tr>
<td>Design Structural Loading</td>
<td>H-20</td>
<td>H-20</td>
<td>H-20</td>
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</table>

*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.* 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 13 through 19).

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 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.

*Refer to the BLM Pocket Field Guide "Road Standards - Excerpts from BLM Manual Section 9113."

**CONSTRUCTION/QUALITY CONTROL**

All roads constructed or reconstructed by Lincoln Road Operators within the Lincoln Road Area will be built to the approved plans, and will comply with all other applicable requirements and stipulations. The construction will be monitored by Lincoln Road 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 Lincoln Road 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, page 10) 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 operators in each field within the Lincoln Road 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.
## CONSTRUCTION CHECKLIST

### General

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<tr>
<td>Is it comfortable to drive at design speed?</td>
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<tr>
<td>Will drainage system take all water away from road?</td>
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<td>Are curves constructed as shown on plans?</td>
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<td>Has topsoil been replaced on slopes?</td>
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<td>Have disturbed/work areas been rehabbed/cleaned up?</td>
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### Roadway Template

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### Drains

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<td>Riprap</td>
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### Other

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<tr>
<td>Turnouts</td>
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<tr>
<td>Fences and gates</td>
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<tr>
<td>Signs</td>
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<td>Bridges</td>
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<tr>
<td>Low water crossings</td>
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<tr>
<td>Pipeline or utility crossings</td>
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<td></td>
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<tr>
<td>Have shoulder, fill and/or cut slopes been flattened to allow access to sheep wagon or other &quot;two-track&quot; trails?</td>
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### Permits

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<tbody>
<tr>
<td>Does construction of the highway approach meet all state highway department permit requirements?</td>
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</tr>
<tr>
<td>Does construction of the county road intersection meet all county and/or permit requirements?</td>
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<td></td>
</tr>
</tbody>
</table>
I have inspected this project and attest that the construction complies with the road plans, all permit requirements, the surface use plan, and the approved APD and/or right-of-way grant stipulations.

Company’s Representative
(Signature and Title)

I have supervised the construction of this project, and attest that all of the construction is in conformance with the plans, specifications and all other permit requirements which apply.

Contractor’s Representative
(Signature and Title)

[ ] I have inspected this project, and find that it was constructed in conformance with the approved plans and all other BLM requirements and stipulations which apply.

[ ] I waive the requirement for a BLM representative to be present during the post construction inspection of this project.

BLM Representative
(Signature and Title)

Others
(Specify)

Copies to:
Company Contractor BLM Other

Date

12

TYPICAL ROADWAY DETAILS

TYPICAL ROADWAY DETAIL
COLLECTOR ROADS

TYPICAL ROADWAY DETAIL
LOCAL ROADS

TYPICAL ROADWAY DETAIL
RESOURCE ROADS

TYPICAL TURNOUT DETAIL

TYPICAL ROADWAY DETAILS
TYPICAL CULVERT DETAIL

TYPICAL WING DITCH DETAIL

TYPICAL DRAINAGE DETAILS
TYPICAL CATTLEGUARD AND GATE INSTALLATION
SECTION AT ROAD C
(With grid and wings in place)

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.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
DIVISION OF TECHNICAL SERVICES
SERVICE CENTER

CATTLE GUARD FOUNDATION
(Precast Concrete)

ESTIMATED QUANTITIES FOR FOUNDATION

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<th>DESCRIPTION</th>
<th>QUANTITIES</th>
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<tbody>
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<td>12</td>
</tr>
<tr>
<td>CEMENT</td>
<td>2.5 CU YD</td>
</tr>
<tr>
<td>CEMENT CURB</td>
<td>3.2 CU YD</td>
</tr>
<tr>
<td>CEMENT CURB CAP</td>
<td>0.4 CU YD</td>
</tr>
<tr>
<td>3/4&quot; REINFORCING STEEL</td>
<td>2762</td>
</tr>
</tbody>
</table>

ALWAYS THINK SAFETY
TYPICAL PLAN VIEW
CATTLEGUARD INSTALLATION FOR R/W FENCE
NOT TO SCALE
LOCATION OF HIGHWAY:

MILES: ________________________ FROM _____________.

FOR INGRESS OR EGRESS TO A RESIDENCE OR BUSINESS AND TYPE ACCESS DRIVE, ON ____________ SIDE OF HIGHWAY, PROPOSED DRIVEWAY.

AGREEMENT:

I, the undersigned property owner, request permission to construct an access driveway (s) or public right-of-way at the given location, subject to the restrictions and regulations contained in the RULES AND REGULATIONS FOR ACCESS DRIVEWAY (s) in WYOMING STATE HIGHWAYS current edition. In consideration of these regulations, the undersigned agree:

1) To construct the 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 informs manner. To use necessary caution to the Department of Transportation and to leave all right-of-way areas in a condition equal to or better than the condition prior to construction.

2) To elevate the traffic on the roadway during construction contrary to present traffic signals, signs, and other signs shown in the Traffic Control Plan, under the policy of the Wyoming Department of Transportation. The applicant agrees to perform all required, necessary, or additional work as required by the Department of Transportation. The applicant agrees to perform all work necessary to keep the roadway safe for public travel.

3) To grade the driveway(s) not to be constructed such that there will be no damage or servicing of vehicles within the roadway right-of-way.

4) That the profile grade of driveway(s) not be constructed as indicated on the attached sketch or plan and shall not be built on or built over any existing utilities that will impair the utility's use of the existing utilities.

5) To grade the project begins W/D of construction is not completed within ________ days after the initiation of construction or one year after the date of approval of the construction has been completed.

6) That any change in land use which would require traffic conditions would notify the applicant for access and new application must be submitted.

7) That the Wyoming Department of Transportation reserves the right to inspect the plans at the time of construction and at all times thereafter until accepted by the Department, and to make changes at any time necessary to satisfy the Department’s request or accepted by the highway. Once approved the 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 set forth under DISTRICT ENGINEER’s REQUIREMENTS/COMMENTS on reverse side, and/or any on the sketch or plans.

APPLICANT: ____________________________

FIRM NAME: ____________________________

ADDRESS: ____________________________

CITY: ____________________________ STATE: __________ ZIP: __________

PHONE NUMBER: ____________________________

SIGNATURE: ____________________________

Revised: June 1993

10-11
SHOULDER OF HIGHWAY

TOE OF HIGHWAY

TOE OF BANK

TOP OF BANK

DRAWINGS NOT TO SCALE

ENLARGED PLAN

SECTION X-X

CENTER LINE OF HIGHWAY

SHOULDER OF HIGHWAY

-2.0%

0+0

010

0+0

-0.00%

SECTION Y-Y

NEAREST TOWN

SEE ENLARGED PLAN

PLAN

SKETCH FOR ACCESS PERMIT
NUMBER:
ACCESS TO
SECTION: TOWNSHIP, NORTH.
RANGE: WEST.
DATE:

NEAREST TOWN

18" x 46" (MIN.) CMP WITH FLARED ENDS

= 2" ASPHALT

6" CRUSHED BASE
DRIVEWAY ACCESS PERMIT APPLICATION

(FOR OFFICE USE)

PERMIT NUMBER:
APPLICANT:
PIN:
DATE RECEIVED:
DATE APPROVED:
DATE AMENDED:
1. AFFILIANT/STRUCTOR NAMES

<table>
<thead>
<tr>
<th>AFFILIANT:</th>
<th>BUILDER:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADDRESS:</td>
<td>ADDRESS:</td>
</tr>
<tr>
<td>PHONE:</td>
<td>PHONE:</td>
</tr>
</tbody>
</table>

2. PERMIT INFORMATION. PLEASE ANSWER THE FOLLOWING QUESTIONS

<table>
<thead>
<tr>
<th>A. Name of County Road on which driveway connects:</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Location of driveway (Section, Township, and Range):</td>
</tr>
<tr>
<td>C. Driveway width: Driveway radius:</td>
</tr>
<tr>
<td>D. List base material and depth of base: (8&quot; coarse gravel, min.) List depth of gravel surface: (4&quot; crushed gravel, min.)</td>
</tr>
</tbody>
</table>

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 3.1 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:
PERMIT CONDITIONS/COMMENTS (This permit is approved subject to the following conditions:

SITE PLAN
Approved by: 
Title: 
Date of Approval:

110
SWEETWATER COUNTY

LICENSE

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) _______________________________ R __ W
Located in Section(s) _______________________________ N
Approximately ________ (miles) (city or well defined point) for the purpose of _______________________________

The Licensee hereby acknowledges and agrees as follows:
1. The utility facility will be placed in a manner to conform with recognized standards applicable Federal, State, or local laws, codes and ordinances and as directed by the County Engineer.
2. 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 cost to the County.
3. The alignment and grade, clearance, materials, pressures, land ties and mile post ties are shown on the plan sheet dated _______________________________.
4. The License will not be modified, transferred or assigned without the consent of the County.
5. The Licensee agrees to conform to the standards for traffic control as outlined in the Manual of Uniform Traffic Control Devices (MUTCD). The Licensee must cease all operations if the traffic control standards are not met.
6. To the extent of the licensee's negligence, therefore, the Licensee 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 relating thereto, arising wholly or in part in connection with the existence of construction, alterations, repairs, renewals, or uses or removals of the Facility as pertain to any County Road.

7. _______________________________

__________________________
FIELD INSPECTED AND CHECKED BY AND RECOMMENDED FOR APPROVAL

The undersigned, the Licensee, hereby accepts this License subject to the terms and conditions contained herein. Effective date of this License is _______________________________ 19

LICENSEE: _______________________________

BOARD OF COMMISSIONERS _______________________________
Chairman _______________________________
County Engineer _______________________________

Verbal approval given to Utility Company on _______________________________

FORM 101 Rev 11/93
DEPARTMENT SPECIFICATION
CRUSHED CULVERT TO ANGLE ACCORDING TO ASPHALT
NOTE: ONLY SHAL. BE MINIMUM FOR UN PAVED COUNTY ROADS. GRAVEL. 95% (OP).
INTERSECTION BE INSTALLED ACCESS BASE TIONS. ON APPROACH WITH COUNTY ROAD.
COMPACTED TO 95% (OP) AS NECESSARY ACCESS SEETER AREA.

DETALL OF ROAD APPROACH
SWEETWATER COUNTY
NOV. 17, 1980
REV. 12-9-80 5-19-81

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°.

CULVERT TO BE INSTALLED AS NECESSARY FOR DRAINAGE.

FILL SLOPES ON ACCESS ROAD SHALL BE MINIMUM OF 4:1 IN APPROACH AREA. FILL TO BE COMPACTED TO 95% (OP).

CRUSHED GRAVEL BASE ON APPROACH AREA SHALL BE MINIMUM 4" THICK, AND COMPACTED TO 95% (OP).

NOTE: FOR UNPAVED COUNTY ROADS, GRAVEL BASE ONLY IS REQUIRED.
UNITA COUNTY ROAD ACCESS PERMIT APPLICATION

APPLICANT:

Property Owner Name: ___________________________ Mailing Address: ___________________________
City: ___________________________________________ Zip: ____________
Anchorage Area Home & Address (if applicable): ___________________________

LOCATION OF PROPERTY:

County Road: ___________________________ Road Address: ___________________________
Located in Section: ___________________________ Township: ___________________________
State: ___________________________ Range: ___________________________ West: ________
Lot: ___________ Block: ___________

ACCESS

Access to be used for ingress and egress to a ___________________________
(design, name, business, etc.)

Area served: ___________________________ Access with (yes or no) _______

Drainage structure (if required) use the _____ length ______ ___________

Note: There some blanks on opposite side of this sheet.

AGREEMENT:

The undersigned property owner or authorized agent, requests permission to construct an access onto a county road.

IP BY: Unita County Engineering & Surveying Dep. ___________________________ (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 prescribed on this application and the attached drawings with any changes indicated on this application and the attached drawings, and hereby approve the construction of the previously mentioned installation as being complete.

District Road Foreman ___________________________ (Date)

LICENSE NO. ___________ DATED: ___________________________ BY: ___________________________

THIS SECTION FOR COUNTY USE ONLY

UNITA COUNTY SURVEYING/PLANNING:

This application is approved for construction subject to the conditions as indicated above.

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 granted above, and hereby approve as constructed.

County Road Foreman ___________________________ Date: ___________________________

PERMIT NO. ___________________________
APPENDIX D
WELL LOCATION MODIFICATIONS INCORPORATED INTO THE RESOURCE PROTECTION ALTERNATIVE
### DALEN's Resource Protection Alternative

<table>
<thead>
<tr>
<th>Twp</th>
<th>Range</th>
<th>Sec</th>
<th>Qt/Qt</th>
<th>Resource Protection Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>20</td>
<td>SE/SW</td>
<td>Delineate wetland and if wetland is found eliminate well</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>20</td>
<td>SE/SE</td>
<td>Delineate wetland and if wetland is found eliminate well</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>21</td>
<td>SW/SW</td>
<td>Delineate adjacent wetland prior to staking and adjust well location to avoid wetland impact</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>24</td>
<td>SE/NW</td>
<td>Directional drill from existing 13-24 or 33-24 well pad to avoid contributing trial segment buffer</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>24</td>
<td>SE/NE</td>
<td>Move well approximately 400 feet north or south to avoid steep slopes</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>24</td>
<td>SE/SE</td>
<td>Directional drill from existing 13-24 or 33-24 well pad to avoid contributing trial segment buffer and steep slopes</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>24</td>
<td>SE/SE</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>25</td>
<td>NW/NW</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>26</td>
<td>NW/NW</td>
<td>Eliminate well to avoid contributing trial segment buffer</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>26</td>
<td>SE/NW</td>
<td>Eliminate well to avoid contributing trial segment buffer</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>27</td>
<td>SE/NW</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>27</td>
<td>NE/SW</td>
<td>Move well approximately 500 feet west to avoid contributing trial segment buffer</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>28</td>
<td>NE/NW</td>
<td>Move well approximately 500 feet west of top bank of Green River</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>28</td>
<td>SW/NE</td>
<td>Move well approximately 500 feet northeast of top bank of Green River</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>28</td>
<td>NE/SE</td>
<td>Move well approximately 800 feet northeast to avoid contributing trial segment buffer</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>28</td>
<td>SW/SW</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>29</td>
<td>NE/NE</td>
<td>Delineate wetland at this location and if no upland site is available in quarter/quarter eliminate well</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>29</td>
<td>SE/NW</td>
<td>Delineate wetland at this location and if no upland site is available in quarter/quarter eliminate well</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>29</td>
<td>SW/NW</td>
<td>Delineate wetland at this location and if no upland site is available in quarter/quarter eliminate well</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>29</td>
<td>NE/SE</td>
<td>Delineate wetland at this location and if no upland site is available in quarter/quarter eliminate well</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>31</td>
<td>SW/NE</td>
<td>Move well approximately 400 feet south to avoid steep slopes</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>32</td>
<td>SW/NE</td>
<td>Delineate wetland at this location and if wetland is found move well approximately 300 feet southwest outside of wetland</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>32</td>
<td>NE/SW</td>
<td>Move well approximately 200 feet west to avoid steep slopes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### DALEN's Resource Protection Alternative

<table>
<thead>
<tr>
<th>Twp</th>
<th>Range</th>
<th>Sec</th>
<th>Qt/Qrt</th>
<th>Resource Protection Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>32</td>
<td>NW/SW</td>
<td>Move well approximately 300 feet west to avoid steep slopes</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>32</td>
<td>SW/SE</td>
<td>Delineate wetland at this location and if no upland site is available in quarter/quarter eliminate well</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>33</td>
<td>NE/NW</td>
<td>Eliminate well to avoid contributing trail segment</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>33</td>
<td>NW/NE</td>
<td>Eliminate well to avoid contributing trail segment and impacts to the Green River</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>33</td>
<td>SW/SW</td>
<td>Directional drill from existing 43-32 well pad to avoid impacts to the Green River</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>34</td>
<td>NW/SE</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>34</td>
<td>SE/SW</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>35</td>
<td>SW/NE</td>
<td>Move well approximately 200 feet northeast to avoid steep slopes</td>
</tr>
<tr>
<td>26 N</td>
<td>112 W</td>
<td>35</td>
<td>NE/SE</td>
<td>Move well approximately 500 feet north to avoid steep slopes</td>
</tr>
<tr>
<td>26 N</td>
<td>111 W</td>
<td>7</td>
<td>NW/NW</td>
<td>Move well approximately 300 feet west to avoid steep slopes</td>
</tr>
<tr>
<td>26 N</td>
<td>111 W</td>
<td>7</td>
<td>SE/SE</td>
<td>Move well approximately 500 feet north to avoid steep slopes</td>
</tr>
<tr>
<td>26 N</td>
<td>111 W</td>
<td>19</td>
<td>NE/NW</td>
<td>Move well approximately 500 feet west to avoid steep slopes</td>
</tr>
<tr>
<td>26 N</td>
<td>111 W</td>
<td>27</td>
<td>SW/NW</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks</td>
</tr>
<tr>
<td>26 N</td>
<td>111 W</td>
<td>32</td>
<td>NE/SW</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks</td>
</tr>
<tr>
<td>26 N</td>
<td>111 W</td>
<td>34</td>
<td>SE/NW</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>2</td>
<td>NE/SW</td>
<td>Move well approximately 300 feet west to avoid steep slopes</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>2</td>
<td>NE/SE</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>3</td>
<td>NE/NW</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>4</td>
<td>NW/NW</td>
<td>Directional drill from existing 22-4 well pad to avoid impacts to the Green River and contributing trail segment buffer</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>4</td>
<td>SE/NE</td>
<td>Move well approximately 400 feet north to avoid steep slopes</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>4</td>
<td>SE/SE</td>
<td>Directional drill from existing well pad to avoid steep slopes</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>5</td>
<td>NE/NW</td>
<td>Delineate adjacent wetland prior to staking and adjust well location to avoid wetland impact</td>
</tr>
</tbody>
</table>
### DALEN's Resource Protection Alternative

<table>
<thead>
<tr>
<th>Twp</th>
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</thead>
<tbody>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>5</td>
<td>SW/NW</td>
<td>Move well approximately 500 feet northwest to avoid steep slopes</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>5</td>
<td>SE/NE</td>
<td>Directional drill from existing 43-5 well pad to avoid contributing trail segment buffer</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>5</td>
<td>NE/SW</td>
<td>Directional drill from existing 34-5 well pad to avoid impacts to the Green River</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>5</td>
<td>SW/SW</td>
<td>Eliminate well to avoid impacts to public campground</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>7</td>
<td>SW/SE</td>
<td>Assure adjacent ditch is not impact during well pad construction</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>9</td>
<td>SE/NW</td>
<td>Move well approximately 400 feet northeast to avoid steep slopes</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>10</td>
<td>SE/SW</td>
<td>Move well approximately 300 feet west to avoid steep slopes</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>11</td>
<td>SW/SE</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>12</td>
<td>SE/NE</td>
<td>Move well approximately 500 feet northwest to avoid steep slopes</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>12</td>
<td>NW/SW</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>13</td>
<td>SE/NE</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>13</td>
<td>SE/SW</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>15</td>
<td>NE/SE</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks</td>
</tr>
<tr>
<td>25 N</td>
<td>112 W</td>
<td>16</td>
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**NOTE:** No conflicts were found for wells proposed by DALEN which are not included on this table.
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</tr>
<tr>
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<td>10</td>
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</tr>
<tr>
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<td>NE/NW</td>
<td>Eliminate well to avoid contributing trail segment buffer.</td>
</tr>
<tr>
<td>23 N</td>
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<td>11</td>
<td>SE/NE</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks.</td>
</tr>
<tr>
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</tr>
<tr>
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<td>Sec</td>
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<td>Resource Protection Measure</td>
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</tr>
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<td>Schedule drilling to avoid antelope crucial winter range period.</td>
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Lincoln Road Operators' Resource Protection Alternative

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<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks.</td>
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<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks.</td>
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<tr>
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<td>13</td>
<td>SE/NE</td>
<td>Evaluate distance from intermittent stream during staking and adjust location to assure edge of well pad is at least 100 feet from stream banks.</td>
</tr>
</tbody>
</table>

NOTE: No conflicts were found for wells proposed by the Lincoln Road Operators which are not included on this table.
APPENDIX E

Outline for Wildlife Protection and Impact Mitigation Plan

1.0 Scope of the Plan

The purpose of this plan would be to identify standard environmental protection and mitigation measures which will avoid, minimize, or reduce impacts to wildlife associated with implementation of additional infill drilling projects throughout the Fontenelle area. The plan would include the following:

1) wildlife protection and mitigation measures described in the Record of Decision prepared for the Fontenelle Infill Drilling Projects;
2) any additional opportunities for mitigation subsequently identified by the core team;
3) specific locations or situations for the implementation of wildlife protection and impact mitigation measures; and,
4) schedules or milestones for the implementation of these measures.

The plan will be developed by a core team consisting of representatives from the DALENE and Lincoln Road Operators, BLM, Wyoming Game and Fish Department, the U.S. Fish and Wildlife Service, and other interested groups such as area livestock operators. The core team will provide advice and recommendations to the BLM Green River Area Manager. The BLM Area Manager retains the ultimate decision making authority for the management of BLM-administered lands and resources. The plan and its implementation would be periodically reviewed by the core team. The plan would be updated periodically to reflect changes in the actual level of infill drilling. This is important as actual drilling may vary substantially with market conditions and could be substantially less than the maximum development scenario addressed in the EIS. Similarly, impacts from some unpredictable percentage of new wells could be offset by future abandonment and reclamation of existing well pads and associated roads.

The scope of the plan would be limited as follows:

- The plan would only apply to the DALENE and Lincoln Road project areas as defined in the EIS.
- The focus of the plan would be mule deer, pronghorn antelope, raptors, sage grouse, fisheries, and Federally listed threatened and endangered species.
- Protection and mitigation actions would be directed toward avoiding, reducing, and mitigating impacts withube the DALENE and Lincoln Road project areas described in the EIS; however, with the agreement of the core team a specific action could be implemented outside of a specific mineral lease but within the cumulative impact study area described within the EIS.

2.0 Goals and Strategies

The following goals are suggested by the analysis of impacts found in the EIS. These goals could be modified by the review team in response to changes in resource conditions, changing habitat conditions, level of actual infill drilling and other unforeseen circumstances. Goals could be achieved by a variety of strategies. Only a few possible strategies are suggested here. The strategies suggested below are not meant to be requirements, especially if alternative means of achieving the same goal can be proposed.

2.1 Goal: Avoid unnecessary construction-related disturbance to wildlife habitat.

Strategies for Attaining Goal: Evaluate well pads, access roads, and pipeline corridors on a site-by-site basis to identify opportunities to minimize construction-related and long-term, production-related disturbance. Well pad size could be reduced to less than the 2.5 acres assumed in the DEIS depending upon site specific conditions and well pad design.
Similarly, pipeline construction rights-of-way could be reduced below that assumed in the DEIS. Use existing roads or two-tracks where available to construct an access road to a new location. Place pipelines outside the backslope of the existing and new roads where feasible. Reduce the size of drill and well pads to the minimum necessary to safely conduct operations. Reclaim areas not needed for production or maintenance operations. Use surface pipeline where feasible. Confin e construction-related traffic to staked rights-of-way and project locations.

2.2 Goal: Maximize restoration of wildlife habitat.

Strategies for Attaining Goal. Apply interim reclamation practices following completion of construction activities. Where drilling fluids can be reused, twice to offset the need for oil and gas operations for pipe reclamation of the drill pad and areas not needed for production operations. Use locally tested reclamation practices. Consult with reclamation contractors and oil and gas operators for reclamation practices (e.g., seed mixtures) successfully applied in the Fontenelle area. BLM should hold an annual one-day conference with representatives of oil and gas companies and their contractors operating in the Rock Springs District to review reclamation practices and identify innovative, successful reclamation practices that have been applied in the Fontenelle area. Disturbed areas (well pads, riparian crossings, steep slopes, etc.) may require fencing after seeding if grazing by livestock, wildlife, or wild horses precipitate successful revegetation of vegetation.

2.3 Goal: Offset unavoidable forage loss, to the extent practical, through timely reclamation and/or vegetation treatment projects which improve the quality of existing habitat.

Strategies for Attaining Goal. Use vegetation treatments (e.g., cutting deciduous sagebrush to increase vegetative productivity) to improve wildlife habitat quality and partially offset losses due to surface disturbing activities. Evaluate and identify opportunities for replacing wildlife forage lost by ripping and seeding roads, two-tracks and trails not needed for field operations, livestock operations, or other resource uses.

2.4 Goal: Protect wetlands and riparian vegetation along the Green River and Big Sandy rivers from degradation.

Strategies for Attaining Goal. As described in the DEIS, locate proposed wells and other surface facilities outside of these areas.

2.5 Goal: Protect fisheries and water quality in the Green River and its tributaries.

Strategies for Attaining Goal. FWS through the DEIS should require operators to provide evidence that they have paid the required water depletion fees intended to mitigate potential impacts to threatened and endangered fish species in the Green River basin if water withdrawal exceeds 100 acre feet per year. Implement best management practices, as described in the DEIS (see Section 4.17.3.1), to reduce sediment in runoff from construction sites and production locations.

2.6 Goal: Reduce misunderstanding of survey, protection and monitoring measures that could be required where threatened, endangered, or candidate species may be affected.

Strategies for Attaining Goal. Consult with the U.S. Fish & Wildlife Service and the Wyoming Natural Diversity Database to maintain, update, or expand the list of Federally listed and candidate species within the Fontenelle area that could, potentially, be affected by oil and gas operations. Based on the Green River Resource Management Plan Final EIS and Record of Decision, and recent U.S. Fish and Wildlife Service policies on threatened and endangered species, develop a list of standard, site-specific survey, protection or monitoring measures that could be required, depending upon site-specific habitat conditions.

2.7 Goal: Identify important wildlife use areas (e.g., sage grouse leks, active raptor nests, crucial winter ranges) potentially affected by project activities that should be protected from disturbance.

Strategies for Attaining Goal. Because these areas can change from year to year, oil and gas operators, in accordance with Section 6 of the Lease Terms, should conduct surveys for nesting raptors, sage grouse leks and threatened or endangered species in potential habitat for those species which may be disturbed by their proposed oil and gas activities. Operators should consult with BLM to identify areas of potential habitat prior to conducting surveys and to avoid unnecessary surveys. BLM should maintain a central file of biological survey reports in the Green River Resource Area Office. These files could be used to identify all areas previously surveyed. This information should be incorporated in the BLM geographic information system (GIS) and these files should be open to the public. Biologists that may be hired by oil and gas operators to conduct surveys for BLM. Biologists conducting the surveys should be required to file completed biological survey reports with the appropriate Resource Area Offices. BLM and Wildlife management agencies would do the following: 1) provide oil and gas operators with a map showing the boundaries of crucial winter range areas at least six months prior to the implementation season restrictions—i.e., no later than May 15 for the coming winter; 2) notify oil and gas operators of changes in the boundaries of crucial winter range areas within 90 days following the identification of such a change.

2.8 Goal: Monitor wildlife use of the area on a regular basis and systematically record changes in wildlife use.

Strategies for Attaining Goal. BLM should cooperate with the WGFSD, FWS, Lincoln Road and DALEN Operators, and wildlife and environmental groups in sponsoring an annual "wildlife count" program conducted by volunteers within this program would provide long-term, year-to-year assessments of bird and wildlife populations in the Fontenelle area. The program could be modeled on the Audubon Society's winter "bird count" program. Observation points and data recording techniques compatible with a geographic information system could be developed by the review team.

2.9 Goal: Monitor the effectiveness of wildlife protection and impact mitigation measures.

Strategies for Attaining Goal. Field check and verify local impacts by monitoring sage grouse habitat suitability and leks. Work with Wyoming Game and Fish Department to improve the usefulness of their surveys for monitoring habitat use. Incorporate such data into BLM's geographic information system.

2.10 Goal: Apply locally appropriate reclamation measures to disturbed areas following abandonment of production locations and associated facilities with the goal of returning these lands to pre-construction habitat conditions.

Strategies for Attaining Goal. Implement BLM policies which already require oil and gas operators to submit an abandonment and reclamation plan. Use native species in seed mixtures. Include shrub species in reclamation seed mixtures. Apply remedial treatments to reclaimed areas not responding to initial reclamation measures.

2.11 Goal: Maintain sufficient habitat over the life of the field to ensure that oil and gas operations do not adversely affect the big game population at the herd unit level.

Strategies for Attaining Goal. Field check and refine location data on high suitability big game ranges and vegetation conditions. Minimize disturbance in areas with a demonstrated high habitat effectiveness. Close unneeded roads, two-tracks, and trails in these areas. Implement off road vehicle closures in areas with a demonstrated high habitat effectiveness.

2.12 Goal: Maintains a program to monitor changes in the water quality of the Green and Big Sandy Rivers to detect changes which would indicate the potential for adverse effects on fisheries and wildlife.

Strategies for Attaining Goal. Work with the U.S. Geological Survey to ensure that water quality monitoring stations on the Green River are maintained and data continues to be collected. Develop a cooperative relationship with the U.S. Geological Survey and Wyoming DEQ whereby water quality is systematically sampled and analyzed at additional locations on the Green River and Big Sandy River in the vicinity of oil and gas operations.

3.0 Wildlife Protection and Mitigation Measures

The following measures are already required by BLM within the Green River Resource Area:

- Where they would occur within big game crucial winter range, construction and drilling are prohibited from the period November 15 to April 30 unless otherwise approved by the authorized officer.
- Exceptions to allow drilling and construction to occur in crucial winter range between November 15 to April 30 must be requested in writing and will be considered based on established criteria.
To minimize unnecessary disturbance, oil and gas operators are responsible for constructing and maintaining roads in accordance with a transportation plan which has been reviewed and approved by BLM.

All oil and gas operators are required to prepare SPC plans.

Carriers hauling bulk oil, diesel and fuels are required to have spill plans.

Cementing of the casing is required to: 1) restore the original formation isolation between formations that existed prior to the drilling of the well; 2) to provide support for the casing by preventing formation pressures from acting directly on the casing; and 3) to retard corrosion by minimizing contact between the casing and corrosive fluids from the formation. This is intended to prevent aquifers from contamination.

To protect important, defined big game birthing areas, activities would be prohibited from these areas between May 1 to June 30.

To protect actively used raptor and/or sage and sharp-tailed grouse nesting habitat, activities or surface use are not allowed from February 1 to July 31 within actively-used areas. This limitation may or may not apply to extended long-term operation and maintenance of a developed project, pending environmental analysis of any operational or production aspects. This restriction is typically applied to areas within 0.5 mile of raptor nests but may be modified depending on nesting chronology, raptor species (e.g., a one mile buffer may be used for peregrine falcons), nest site location, and topography. Inactive nests would be exempt. The restriction also applies to areas within 0.25 mile of active sage grouse leks.

The following measures which have implications for wildlife protection and impact mitigation or avoidance were identified as possible (weather permitting) to take advantage of winter moisture.

- Seeding would be accomplished during the fall (September or October) after -weather permitting- to take advantage of winter moisture.

- Native species would be required for seed mixture use in reclamation.

- BLM would require fencing (well pads, riparian crossings, steep slopes, etc.) after seeding if grazing by livestock, wildlife, or wild horses is predicted to destroy the seed and/or revegetation. Dikes would be constructed around condensate, produced water and methanol tanks to contain any potential spill and to protect surface water.

- Upon abandonment of wells on public lands, the operators would be required to contact the BLM for approval of a final reclamation plan.

- Topsoil would be stripped from areas to be disturbed and stockpiled to aid in subsequent reclamation and revegetation.

- Wells would be located outside of wetlands, historic sites, historic trail buffers and steep slopes (25 percent or greater);

- Vehicular traffic speed limits could be placed by the operators to help reduce vehicle- animal collisions.

- Heavy truck traffic (e.g., oil, produced water haulers) would not use the road across Fontenelle dam, or use roads within Seedskadee National Wildlife Refuge (NWR) except for through traffic.

- Wells within the Lincoln Road Development Area would be at least 0.25 miles from the boundary of Seedskadee NWR and would average about 0.75 to 1 mile from the Green River within the refuge.

- Reserve pit liners would be incorporated into the design of wells in the Green River floodplain.

- Solidification of reserve pits could be required in some cases by BLM.

- Water for drilling, construction and road watering would be withdrawn from existing water wells or under existing water rights from the Green River.

- Well pads would be prohibited from steep slopes unless special erosion control and reclamation measures were approved by the authorized officer.

- Well pads would be located at least 100 feet from intermittent drainages to reduce sedimentation and disturbance to saline soils which could affect water quality in the Green River.

- Facilities would be located outside of floodplains in deeply incised canyons.

Pumps or tank trucks used to withdraw water from the Green River should be located at least 100 feet back from the river bank wherever feasible.

Portable/free-standing diesel-powered pumps would be prohibited for water withdrawal would be located within a containment device to decrease the impacts of a pump fuel spill on the Green River.

Water withdrawal sites would be gravely, unless otherwise specified by the BLM Authorized Officer, and hoses used to withdraw water would be clean and not contaminated with drilling fluids. Water withdrawal sites on federal lands would be approved by BLM and no sites would be located within Seedskadee National Wildlife Refuge.

No refueling of vehicles or construction equipment would occur within 100 feet of a wetland, surface water, intermittent or perennial stream or drainage.

No trucks, vehicles, construction equipment, water trucks, or heavy equipment would enter the Green River or any other flowing stream or water body.

Oil and gas operators would inform their employees, contractors, and subcontractors that washing of trucks, vehicles, construction equipment, water trucks, or other equipment in the Green River is prohibited and violators will be subject to dismissal.

Roads or pipelines should cross drainages at a right angle wherever feasible. Crossings should be constructed during periods of low flow when the stream bed is dry. Stream banks and bottom should be returned to a stable contour and banks at the crossing stabilized, if necessary, with rip-rap.

Well pad design would incorporate sediment and drainage control structures. (Examples of such structures are discussed in Section 4.17, DEIS).

Oil and gas operators would inform their employees, contractors, and subcontractors that any bauxite found to be dumping drilling fluids into surface waters or withdrawing water from the Green River in a permit will be subject to dismissal and their actions reported to the Wyoming Department of Environmental Quality (WDQ) or Wyoming State Engineers Office (WSEO).

Trench dewatering and the discharge of hydrostatic test water would be conducted in compliance with WDEQ notification and permit requirements and in a manner which will minimize sedimentation and impacts to surface water. Water would be discharged into areas where it will not flow into perennial or intermittent stream channels or prairie dog burrows. Silts, silt filters, such as hay bales or silt fences, should be incorporated into the discharge plan to intercept runoff and prevent sediment from reaching streams.

Reduce sediment transport by designing, installing, and maintaining structures such as rock check dams, rip-rap, drop structures (see DEIS, Section 4.17).

As part of maintenance of existing roads, install structures (e.g., sediment traps in road ditches) which would reduce sediment transport from road ditches into drainages.

Reclaim all close roads within canyons or adjacent to drainages which are not needed to serve existing oil and gas production sites or for livestock grazing operations.

Monitor drainages and sediment control structures to determine whether potential sediment transport in drainages leading to the Green River have been reduced.

To protect surface water and shallow groundwater (i.e., the Green River floodplain), reserve pits in the floodplain should be designed for dewatering and/or sediment treatment. A closed or semi-closed mud system would be used in these areas. To speed removal of drilling fluids, pits in floodplains would be dewatered upon the completion drilling. (Where affected lands and minerals in the floodplain are privately owned, BLM's authority to require measures on private lands is limited.)

Surface pipelines in floodplains would be anchored to prevent their shifting or breaking loose in the event of high water. Stream beds and banks should be returned to a stable contour and ramp at the crossing stabilized, if necessary, with rip-rap.

Well pad design would incorporate sediment and drainage control structures. (Examples of such structures are discussed in Section 4.17, DEIS).

Oil and gas operators would inform their employees, contractors, and subcontractors that any bauxite found to be dumping drilling fluids into surface waters or withdrawing water from the Green River in a permit will be subject to dismissal and their actions reported to the Wyoming Department of Environmental Quality (WDQ) or Wyoming State Engineers Office (WSEO).

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contractors and subcontractors to adhere to State and Federal game laws as a condition of employment could be grounds for dismissal.
--- To minimize poaching, oil and gas operators should inform their employees, contractors, and subcontractors that firearms should be forbidden at work sites.
--- Similar to other projects in the BLM's Rock Springs District, all operators should adopt a policy of prohibiting dogs at work sites to reduce the potential for harassment of wildlife.
--- As part of their transportation plans, oil and gas operators should identify: 1) roads and two-tracks that would not be needed for oil and gas development and that could be considered for reclamation and closure in coordination with BLM; and 2) roads that would be closed to limit access to habitat utilized by wintering bald eagles.
--- As part of their transportation plans, oil and gas operators should, in cooperation with BLM, identify roads that would be closed to the public, especially during winter and spring. Wildlife habitat models for mule deer winter range habitat and sage grouse nesting habitat could be utilized to identify areas that would most benefit by road closure during the respective seasons.
--- Where project sites would be located in potentially suitable habitats, surveys should be conducted to determine whether the area is being used for nesting by ferruginous hawks, burrowing owls, and loggerhead shrikes. Unless otherwise approved by the BLM authorized officer, if nesting loggerhead shrikes or burrowing owls are found, no activities should occur in the utilized habitat during the reproductive period—mid-April through July; no surface disturbing activities should occur within one mile of an occupied ferruginous hawk nest site from mid-March through early July; and no project component should be located within 820 feet of any nest structure actively used by ferruginous hawks.
--- Surveys to locate bald eagle roost trees, perch sites, and feeding areas along the Green River should be conducted by the BLM, WQFD, and/or FWS to ensure that appropriate mitigation measures (buffer areas, scheduling, etc.) are being implemented.
--- No potential nest trees for bald eagles or other raptors in the Green River floodplain should be removed.
--- If plovers are found to be nesting or rearing broods on a site planned for development, the project component should be moved to avoid impacts to mountain plovers. If necessary, operators should minimize impacts to nesting plovers by scheduling activities to avoid the late spring through July nesting period.
--- Companies, with the cooperation and assistance of the BLM, WQFD, and FWS, would provide all project-related personnel with information about State and Federal game laws.
--- Companies should work with WQFD on a program to offer a reward for information leading to the arrest of poachers.
--- Identify unnecessary roads constructed and used by the companies within their project area that could be reclaimed and where abandoned well pads and other well-field facilities have not been adequately reclaimed. Wildlife habitat models (pronghorn summer habitat, mule deer winter habitat, sage grouse nesting habitat) could be used to identify and prioritize areas that would most benefit by renewed reclamation.
--- Identify where newly constructed and existing roads within their transportation network will intersect two-track roads and provide barriers where these two-track roads intersect existing and proposed roads.
--- Evaluate existing BLM-administered stock ponds within the project area and make improvements, where necessary, so they will retain water for use by livestock, wildlife, and wild horses. Improvements would include reconstruction of dams and installing snow fences within stock pond drainages to increase potential water source. Wildlife habitat models (pronghorn summer habitat, sage grouse nesting habitat) could be used to identify and prioritize areas where stock pond improvements would most beneficial.
--- Consideration could be given to the construction of improved water sources for wildlife (e.g., guzzlers) within key sage grouse nesting habitats and key pronghorn summer range habitats that would be fenced to prevent livestock use. Wildlife habitat models (pronghorn summer habitat, sage grouse nesting habitat) could be used to identify and prioritize areas that would most benefit from new water sources.
--- Consideration could be given to drilling water wells for wildlife use. Wells should have the capability for seasonal shutdowns so they do not retain wildlife on inappropriate seasonal ranges. Wildlife habitat models (pronghorn summer habitat, sage grouse nesting habitat) could be used to identify and prioritize areas that would most benefit from new water sources.
--- Within demonstrated, high suitability big game crucial winter ranges, limit well site visits to midday (10 am to 4 pm) during winter (November 15 to April 30) to avoid disrupting big game during principal feeding periods.
--- Place roads and well pads to avoid sage grouse leks and demonstrated, high suitability nesting habitat.
--- Consideration could be given to constructing artificial nesting structures for use by ferruginous hawks and golden eagles in areas where no suitable nesting substrates are present and in which no proposed construction activities would occur.
--- Flag reserve pits between completion of drilling and dewatering of the pit. In situations and at locations to be specified by BLM, reserve pits should be covered with netting.

4.0 Implementation Schedule
BLM will establish a review team within 2 months following the BLM Record of Decision. A draft plan would be completed within six months following the decision and a final plan would be approved within one year following the BLM decision.
APPENDIX F

ROCK SPRINGS DISTRICT PETRIFIED WOOD COLLECTION POLICY

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Rock Springs District Office
P.O. Box 1869
Rock Springs, Wyoming 82901-1869
3622 (413e)
8365.1-5

October 12, 1995

Dear Rockhounding Friend:

PETRIFIED WOOD is available to the public on a free use basis in limited quantities. Mining claims may not be staked for petrified wood. Petrified wood is defined as agatized, opalized, petrified, or silicified wood, or any material formed by the replacement of wood by silica or other matrix. Petrified wood in the Rock Springs District can only be disposed of by free use. Due to the limited nature of the petrified wood resources, the Rock Springs District does not allow issuance of commercial permits for petrified wood. According to regulations (43 CFR 3622), free use collection weights are limited to 25 lbs per day plus one piece, not to exceed 250 lbs in one calendar year, and no specimen greater than 250 lbs may be collected without a special permit. Further, heavy equipment and explosives may not be used, and no unnecessary or undue degradation may take place. The free use petrified wood must be only for personal use, and shall not be sold or bartered to commercial dealers.

Evidence of commercial activities related to any type of collecting (such as sale brochures at rock shows and advertisements) will be actively investigated.

Any matrix (material enclosing and attached to the specimen) not removed from the petrified wood in the field will be counted as part of the 25 pound plus one piece daily limit, since there is no practical way in the field to determine weights of petrified wood versus matrix. For multiple day staking, the 25 pound limit applies in the field, but daily limits for each previous day should be kept in mind. Barricades and flagging must mark active open holes when unattended (such as at night). All holes must be refilled and smoothed at the end of each collecting trip.

COMMONLY COLLECTED ROCKS AND MINERALS, referred to as “common variety” are not subject to disposal through mining claim location. Stones such as agate, chert, jasper, and obsidian, as well as clinders and other volcanic products, when used for common purposes such as the manufacture of cements are not locatable. The mere fact that some stones may be cut and polished gives them no distinct or special value to make them locatable. These commodities may be collected in reasonable amounts for non-commercial purposes according to regulations (43 CFR 8365.1-5). Large quantities of these commodities to be used for commercial purposes may be disposed of under the Mineral Material Sale regulations, which govern disposal of sand and gravel. Small sales of these materials may be made from community pies and common use areas. Whether a particular deposit would be sold, however, would depend on several factors, including the environmental impacts of the proposal.

Some gemstones (such as diamonds, or jade for example) may still be locatable if they meet various criteria addressed in the mining laws. Collectors should take care to respect the rights of a mining claimant. Unstaked claims are still public lands open to public use, and rockhounds may pursue their hobby on such lands as long as they do not interfere with mining activities or collect minerals or gemstones for which the claim is located. The material claimed may be treated as the claimant’s private property only for the purposes of developing a paying mine. A mining claimant may not legally charge fees for recreational use of an unstaking mining claim. A claimant’s activities on an unstaking mining claim are limited to “prospecting, mining, or processing operations; and uses reasonably incident thereto”; and he “is forbidden to use it for any other purpose” (43 CFR 3712.1(b)).
ARCHEOLOGICAL, PALEONTOLOGICAL, AND OTHER REGULATIONS, and land use policies found in local planning documents must be adhered to while collecting petrified wood, rocks, and minerals. Off-road vehicle use must stay on existing roads and trails. It is permissible to collect reasonable amounts of common invertebrate fossils for non-commercial purposes. However, collection of vertebrate fossils such as fish and dinosaur bones is not allowed. Defacing, disturbing, removing, or destroying scientific, cultural, or natural objects or areas not specifically identified as collectable within the regulations is prohibited. The collection, excavation, disturbance, damage, defacement, alteration, exchange, purchase, sale, offer to sell/purchase/exchange, or transport of cultural materials, including all historic artifacts, prehistoric artifacts, and locations of historic/prehistoric activity, is strictly prohibited without appropriate written authorizations and permits.

UNDUE AND UNNECESSARY DEGRADATION of the public lands must be prevented during all collecting activities. Undue and unnecessary degradation means impacts greater than those that would normally be expected from an activity being accomplished in compliance with current standards and regulations and based on sound practices including use of the best reasonable technology. It also takes into consideration the effects of the activity on other resources and land uses, including those resources and uses outside the area of activity. The following practices which represent the usual, customary, and proficient manner for collecting petrified wood and other materials are suggested to prevent undue and unnecessary degradation of public lands while collecting:

1. Keep informed about and observe all laws, regulations, or rules governing collecting on public lands.
2. Assist as nearly as possible the boundary lines and ownership of the property upon which collecting is planned.
3. Respect both public and private property, and do not collect on privately owned land without the owners permission.
4. Use no blasting material, or mechanized digging equipment in the process of collecting.
5. Avoid causing damage to collecting materials and areas, and take home only material that can reasonably be used.
6. Avoid causing damage to property of any kind such as fences, signs, buildings, etc.
7. Leave all gates as they are found.
8. Build fires only in designated or safe places, and be certain they are completely out before leaving the area.
9. Do not discard burning materials such as matches or cigarettes.
10. Do not contaminate wells, creeks, or other water supplies.
11. Limit active hole size to 18 sq. ft. in area and no more than 4 ft. deep at any point in time (except in finish removal of material exposed by excavation above the 4 ft. depth).
12. Fill in all excavation holes.
13. Report to the appropriate public land managers any deposit of previously unknown material or significant natural resource which should be protected for the enjoyment of future generations or for public educational and scientific purposes.

Please remember to take pride in your public lands and be a responsible user. If you need any additional information, please contact the BLM offices in Kammerer (307) 877-3933, Pine Dale (307) 367-4358, or Rock Springs (307) 382-3150.

Sincerely,

[Signature]
District Manager

APPENDIX G

EROSION CONTROL, REVEGETATION, AND RESTORATION PLAN (ERRP) OUTLINE
APPENDIX G

EROSION CONTROL, REVEGETATION, AND RESTORATION PLAN (ERRP) OUTLINE

The purpose of developing an ERRP is to allow for cooperative innovation in site development and reclamation of a disturbed area to a predetermined land use for wellfield and treatment plant activities. The following is an outline of topics to be covered in an ERRP. All ERRPs must address these points but they are not limited to them. Although the ERRP is a formal document, amendments can be approved by the Authorizing Officer.

I. INTRODUCTION

Clear Identification of Reclamation Goal.

This is to be identified by the Federal Land Management (FLM) agency concerned and should include specific goals for percent perennial cover and species diversity expected for successful reclamation. Predisturbance cover would be used as a guideline for establishing goals.

Short description of activity causing disturbance and project time frames.

- Proposed Start Date
- Duration of Project
- Completion Date
- End of Project Life (Estimate)

Set time frames for ERRP.

- Seasonal reviews to initiate change.
- When plan would be considered implemented.

Soil surveys may be required in intensively developing areas for site development mitigation and impact analysis.

II. OBLIGATION

Exactly who (individual name, address, phone) is responsible for what in the:

- Design of Plan
- Execution of Plan
- Monitoring of Progress

An experienced and trained professional (i.e., soil scientist, reclamation specialist) that has been approved by the Authorized Officer (AO) is required to prepare and lead the implementation and monitoring of this plan.

III. SITE MAP FOR PROJECT SHOULD INCLUDE

This information should not just cover the proposed disturbed area, but should extend beyond site boundaries by approximately 150 yards.

Soil Description and Boundaries Symbols.

- Soil Outcrop
- Photo Record Point
- Riparian Areas
- Saline Areas

Location and Volume of Proposed Material Stockpiles.

- Time Material Would Be Stored
- Type of Material in Pile

Identify Existing Drainage Patterns.

Identify Existing Vegetative Cover.

Identify Existing ORV or Two-Track Roads.

IV. ZERO RUNOFF

Zero runoff for purposes of the ERRP means: No portion of natural or man-caused liquid would leave the disturbed area by either surface or sub-surface flow.

All disturbed sites, except linear rights-of-way, would maintain zero runoff until the area is stabilized. Stabilization would be a value that must be clearly defined in the plan.

Stabilization for purposes of the ERRP is to mean: That point in time when neither erosion nor deposition occurs which is greater than pre-disturbance. This point must be measurable (site monitoring) and self-sustaining, i.e., not dependent on site maintenance.

The AO can approve a variance from zero runoff based on detailed site specific analysis that would consider meteorology, topography, water quality, and special site design and/or construction measures.

V. EROSION CONTROL MEASURES

Description of Proposed Measures.

- Identify levels of runoff planned for, i.e.: 50 year storm, etc.
- Include capacity of all retention structures and engineering design.
- Map locating erosion control measures placement.
- Include Zero Runoff Measures.

VI. FUGITIVE DUST CONTROL

Watering or other approved dust abatement procedures would be done to prevent severe wind erosion and loss of soil materials during construction.

Describe:

- How and When

VII. REVEGETATION

Type
- Seed
- Established Stock

Site Preparation
- Planting
- Planting Time Frames
- Planting Method and Equipment

Fertilization Program
- Rationale for Fertilizing or Not Fertilizing

VIII. MONITORING SITE RECLAMATION PROGRESS

Methods
- Time Frames
- Photo Record Station (with location) of Site Pre-disturbance

IX. SITE ABANDONMENT

Include Time Frames

X. POTENTIAL PROBLEMS

Address Possible Weak Points
- Erosion
- Slumping
- ORV Use (i.e., cover points that might conflict over ERRP implementation with area land use goals)
- Snow (management)
- Company Fire Policy (weed control) Vs. Vegetation Management Goals
Examples of Possible Erosion Controls for Well Pads

NOTE:
Not all measures would be implemented at a well pad.
Staked Straw Bale Energy Dissipator

Straw Bales Laid on End

Dewater Structure Installation

2" x 2" Wood Stakes or ½" Rebar

Pump Hose or Pipe

Stakes

Profile View

Double Layer Seamless Plastic Sheeting or Light, Woven Geotextile Fabric (i.e., 3 oz./yd²) on top of Bales.
Depending on topography, extend bales around spoil to assure sediments are contained.

Replace Straw Bale or Silt Fence Barriers at the end of each work day where necessary to prevent sediment from entering stream.
Use Staples or Wire Rings to Attach Fabric to Post

Filter Fabric Material, 36" Wide Rolls

2' X 2' Wood Posts, Standard or Better or Equal Alternate: Steel Fence Posts

NOTE: Use Amoco Silt Fence Fabric, style 1380, or equivalent

Trench
EMBEDDING DETAIL

2" X 2" Stake, Typical

Angle First Stake Toward Previously Laid Bale

Wire or Nylon Twine

Key-In Where Possible

Bales Placed on Side so Twine Is Not in Contact with the Ground

ANCHORING DETAIL
**NOTES**

- Embed bales 4 to 6 inches.
- Drive stakes minimum 12" into ground surface.
- Silt Fence Fabric may be used.
- See Typical Drawings for installation of Straw Bale or Silt Fence Sediment Barriers.

**STRAW BALE SEDIMENT BARRIERS IN DITCHES OR SWALES**
DIVERSION DITCH

Bottom Width: 2 Feet Minimum; The Bottom Width Shall be Level
Depth: 1 Foot Minimum
Side Slope: 2:1 Maximum
Grade: Maximum 5 Percent, with Positive Drainage to a Suitable Stabilized Outlet

NOTE: Typically used on the top of slopes to divert runoff away from the slope face below.

These structures can also be used to direct runoff from the right-of-way away from streams, wetlands and adjacent properties and may be constructed parallel to the right-of-way.

DIVERSION DIKE

Compacted Dike Material

NOTE: Typically used on the top of slopes to divert runoff away from the slope face below.

These structures can also be used to direct runoff from the right-of-way away from streams, wetlands and adjacent properties and may be constructed parallel to the right-of-way.
NOTE:
Waterbars will be vegetated to stabilize the waterbar and to prevent erosion of the channel bottom.

<table>
<thead>
<tr>
<th>WATERBAR SPACING</th>
<th>Percent Grade</th>
<th>Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 - 15</td>
<td>300 ft.</td>
</tr>
<tr>
<td></td>
<td>15 - 30</td>
<td>200 ft.</td>
</tr>
<tr>
<td></td>
<td>&gt; 30</td>
<td>100 ft.</td>
</tr>
</tbody>
</table>

Flow to a Stable Surface, i.e., Existing Vegetation, Rock, or Rip Rap

Typical Cross Section

Permanent Waterbar
Typical Installation
APPENDIX H

SUMMARY AND RESPONSE TO PUBLIC COMMENTS RECEIVED ON THE FONTENELLE NATURAL GAS INFILL DRILLING PROJECTS FINAL EIS

APPENDIX H
RESPONSE TO COMMENTS

Eighty-four individuals provided comment in letters received on the final EIS. The individual comment letters are on file in the Rock Springs District, Green River Resource Area Office and may be reviewed by any interested party by contacting the Green River Resource Area Manager. A list of commenters by category follows:

State Agencies
- State of Wyoming Office of the Governor
- Wyoming Game and Fish Department
- Public Service Commission
- Department of Commerce
- Department of Environmental Quality

Federal Agencies
- USDA-Forest Service
- Environmental Protection Agency

Environmental Organizations
- Sierra Club Legal Defense Fund, Inc.
- Wyoming Outdoor Council
- National Wildlife Federation
- Yellowstone Coalition

Industry
- Tom Brown, Inc.
- Presidio Oil Company
- Amoco Production Company
- Sherwood Enterprises, Incorporated
- L.P. & A. Trucking
- Rocky Mountain Casing Crews, Inc.
- Security DBS

Associations
- Independent Petroleum Association of Mountain States
- American Lands Access Association Inc.

Individuals
- 38 individuals concerned about protection of Blue Forest Petrified Wood Site:
  D. Eastman
  B. Cranston
  G. Loud
  L. Jorgensen
  P. Jorgensen
  V. Williams
  C. Treiblock
  B. Treiblock
  R. Romack
  J. Carpenter
  D. Covalli
  J. Covalli
  C. Blickleidt
  D. Blickleidt
  B. Blickleidt
  V. Blickleidt
  D. Blickleidt
  P. Blickleidt
  R. Clark
  S. Clark
  R. Ford
  F. Ford
  J. Janson
  R. Janson
  D. Holland
  S. Holland

- 3 individuals concerned about protection of air quality related values in wilderness; concerns over wildlife, water quality and recreational impacts; manage for multiple use:
  C. Corsi
  L. Berger
  A. Silverstein
  S. Harris
  P. Crane
  E. Crane
  L. Hicks
  M. Lindsey
  J. Pulitzer
  B. Springman
  J. Kuskel
  C. Kuskel
  B. Buzlander
  L. Benson
  R. Benson
  S. Thornton
  J. Larson
  R. Larson
  T. Bougy
  M. Wurth
  J. Troux
  C. Ewald
  R. Studenmund

- 3 Letters Supporting Responsible Development
  J. Collingwood
  T. Kaumo
  J. DePoyster
The impacts of winter, spring, potential impacts (VOC) emissions, and the recognition that such comments would involve dealing with various segments of the public. Although statements of opinion have not been responded to individually in this Appendix, it is recognized that such comments provide useful insight into public perceptions of the proposed projects. The comments received on the Fontenelle Final EIS have been synthesized into areas of common concern and responded to in the following.

I. AIR QUALITY

AIR QUALITY IMPACTS IN WILDERNESS AREAS

The Wyoming Outdoor Council, Sierra Club Legal Defense and Education Fund, and 33 individuals, as well as the USDA-Forest Service and Environmental Protection Agency expressed concern that the Fontenelle and Moxa Arch natural gas infill development projects would cause serious impacts to the air quality related values of the wilderness areas within the Bridger-Teton and Shoshone National Forests. Foremost concern lies with impacts to visibility and the acid neutralizing capacity of the high mountain lakes within the wilderness areas of the Wind River Mountains. Some felt that the analysis conducted was not complete and that it was not scientifically defensible. The Sierra Club believes that BLM mismatches the cumulative impacts of the Fontenelle Project on the air quality of southwestern Wyoming.

Potential impacts to air quality represents the greatest concern expressed by the commenting public as well as the USDA-Forest Service and Environmental Protection Agency (EPA). The BLM acknowledges this concern, particularly regarding the potential for significant cumulative impacts to occur to visibility and atmospheric deposition within the high mountain wilderness areas of the Bridger-Teton and Shoshone National Forests. For this reason, the decision made approving implementation of the Fontenelle Projects represents an emission cap to ensure that no serious impacts occur to air quality, including visibility and acid neutralizing capacity of high mountain lakes. The USDA-Forest Service and EPA concern is the basis for the total NOx emissions cap of 977 tons per year for new emission sources within the Rock Springs District (including the Moxa Arch, Fontenelle, Stagecoach Draw, and Jonah development projects).

Also, the DEQ expects to see significant decreases in NOx emissions within southwestern Wyoming from existing sources as a result of the Clean Air Act Amendments of 1990 through the Acid Rain Program and the Chapter 30 Operating Permit Program. In conjunction with this expectation, the DEQ has agreed to encourage offsetting or reducing NOx emissions from proposed or existing activities when permitting new emission sources or processing permit renewals within southwestern Wyoming. These measures and requirements will help mitigate potential NOx emissions impacts.

In addition, in response to the concerns expressed by southwestern Wyoming citizens, the Wyoming Governor, during his recent "Kitchen Table" meeting (April 1996), involving several State and Federal agencies, by consensus established the Interagency Committees on Air Quality. The function of these Committees is to reach agreement on the parameters affecting air quality in southwestern Wyoming, and to coordinate information and policy considerations. Although these Committees have no intrinsic authority, they will complete their commissioned tasks and submit recommendations to the Governor for action. Membership on these Committees will eventually include both industry and public interest groups.

The general tasks of the Interagency Committees on Air Quality are summarized as follows:

- The University of Wyoming (through the EPCSORE Program) will address air inclusion entering Wyoming from outside the State and characterize the pollutants' chemical composition, to assist air quality assessments in southwestern Wyoming.
- The Wyoming Air Quality Policy and Technical Committees (established in April 1996) is strictly a coordinating body, the sole purpose of which is the coordination of data, analysis and policy considerations, and to reach consensus regarding air quality management in southwestern Wyoming.

The information and recommendations resulting from the Interagency Committees will aid future Federal and State air quality analysts.

The "Moxa Arc and Fontenelle ESAs: Air Quality Technical Study" and Cumulative Impact Analysis of the Wyoming Natural Gas Development Projects on Air Quality, (Cumulative Impact Analysis), proposed by TRC Environmental Corporation for the Bureau of Land Management (May 1996), for purposes of environmental impact analysis, is a complete and scientifically defensible analysis of potential air quality impacts and as such meets the intent of NEPA.

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. Rather, the "less conservative" emissions scenario represents the more likely development.

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 is the maximum number of compressor engines that will be installed.

Both the Environmental Protection Agency (Region VIII) and USDA-Forest Service expressed the following concerns regarding the BLM's potential visibility impact analysis:

- impacts were not calculated on days where the relative humidity was above 66 percent, and only daytime relative humidity values were included.

- potential volatile organic compounds (VOC) aerosol formation, which can cause significant visibility reduction.

- A visibility threshold level of 0.5 deciview should be used to determine potential "significant impacts," rather than the 1.0 deciview threshold used in the analysis.

BLM used average daytime relative humidity (RH) values, measured at Rock Springs concurrently with the Craven Creek meteorologic data used for modeling potential impacts in the daytime visibility impact analysis. Further, as stated in Section 6.2 of the Cumulative Impact Analysis "If the RH was greater than 66% the day was excluded from the analysis. Statistical relationships between observed fine particle concentrations are well understood when RH <68%, however, this relationship degrades logarithmically for RH >68% invalidating the regional haze analysis. In addition it is likely that RH >68% in Wyoming is attributable to precipitation events, also invalidating regional haze calculations." Further, the regional haze analysis assumes potential impact on "the 90th percentile best-case visibility for each of the four seasons" (reported at 262 km - winter, 204 km - spring, 191 km - summer, and 224 km - fall). It is unlikely that these very clear observations would occur when daily average relative humidity exceeds 68 percent, and impossible that every day in season would exhibit the same very clear visibility as assumed in the regional haze analysis.

Regarding volatile organic compound (VOC) aerosols, the Cumulative Impact Analysis (pages 6-5 and 6-6) describes the lack of scientific credibility for analyzing VOC visibility impacts. The Analysis concludes "Even if data existed that could be used to estimate the [VOC] aerosol yield, models do not exist that can simulate the condensation/evaporation processes and plume dilution which are necessary to quantify the impacts of such aerosols."

Finally, the visibility impact threshold of 1.0 deciview change is generally accepted in the scientific community (although some have made that the threshold should be 2.0 deciview). As a matter of fact, the unitary nature of 1.0 deciview was selected specifically to make it easy to track of perceptible change regardless of background visibility conditions (a percent contrast change does not). Nevertheless, BLM recognizes that it is up to the discretion of the USDA-Forest Service to establish a
The Environmental Protection Agency (Region VIII)

further stated:

- EPA's own screening analysis indicates that visibility degradation in Class I areas may already be occurring and, unless mitigated, new emissions will further exacerbate the problem.

- The regional base analysis considers only the emissions from the Moxa and Fontenelle fields.

Regarding current visibility degradation in the Bridger Wilderness area, the EPA has authority under the Clean Air Act to address existing visibility impairment from major stationary (Section 169A) or mobile (Section 169B) sources. Although the BLM does not have similar regulatory authority, it is available to provide EPA technical assistance, if requested.

The Cumulative Impact Analysis (pages 6-6) states: "As a 'worse case,' it was assumed that all the wells in Moxa Arch, Fontenelle, Jonah Field, and Stagecoach Draw (2,754) were operational. Other sources were assumed to be either existing and included in background, or physically located where concurrent visibility impacts would not occur within the PSD Class I area. The Cumulative Impact Analysis is not a regional PSD visibility analysis, but rather an assessment indicating what potential visibility impacts might occur. At the time of the pre-construction air quality permit application, Wyoming DEQ can require a much more detailed analysis.

Both the Environmental Protection Agency (Region VIII) and USDAs Forest Service expressed the following concerns regarding the BLM's potential atmospheric deposition impact analysis:

- anticipated NO emission levels will exceed limits of acceptable change for ANC (Acid Neutralizing Capacity) in extremely sensitive lake ecosystems (where background ANC is less than 23 mg/l).
- these extremely sensitive lakes are already on the brink of crossing over into the unacceptable category for ANC.

The Cumulative Impact Analysis (pages 6-2 and 6-3) addressed ANC data for lakes in the USDAs Forest Service indicated have a background ANC less than 25 mg/l. The Cumulative Impact Assessment states "The U.S. Forest Service has expressed concern regarding Klondiike Lake because its ANC is '...very low; 20 microequivalents per liter'" (Nelson, 1996). The USDAs Forest Service has indicated that additional nitrogen deposition at Klondiike Lake, or any of the other extremely sensitive high mountain lakes identified during the EPA's Western Lakes Survey (1985), with ANCs less than 25 mg/l, would cause exceedances of the USDAs Forest Service ANC threshold. The USDAs Forest Service recognizes that the Western Lakes Survey ANC measurements are a single measurement, and subsequent measurements of ANC have not been made.

The Cumulative Impact Analysis further examines background impacts from Ross Lake in the Lower Bridger Wilderness area, which were 13 mg/l in 1983, but up to 50 mg/l in 1992. The Analysis concluded "It is unknown if this apparent increase reflects changes in lake chemistry, or is an artifact of changes in analysis procedures."

Regarding existing atmospheric deposition impacts in the Bridger Wilderness PSD Class I area, EPA has the Federal regulatory agency with authority under the Clean Air Act to address air quality degradation throughout the United States. Although the BLM does not have regulatory authority, it is available to provide EPA technical assistance, if requested.

The Environmental Protection Agency (Region VIII) expressed the following concerns regarding the Cumulative Impact Analysis:

- "near field" air quality impacts are incorrectly incentive to the number of wells developed, and the "de minimize" modeling screening technique.
- potential NOx PSD increment consumption was considered only the Moxa Arch and Fontenelle natural gas projects.

The Cumulative Impact Analysis (Section 5.1) for both the construction phase (particulate matter and nitrogen dioxide) and production phase (carbon monoxide, nitrogen dioxide, ozone, and hazardous air pollutants), and compared the predicted air quality impacts to applicable Wyoming and Federal Ambient Air Quality Standards and PSD Class II increments for the "less conservative" emissions scenarios were examined (Sections 5.4 through 5.6, and 6.0), then compared to applicable PSD Class I increments, visibility and atmospheric deposition impacts in the Bridger Wilderness Area.

Based on a "worst case" well spacing of 1/4 mile, maximum potential pollutant concentrations were modeled and compared to applicable standards. The "de minimis" modeling screening technique was not used, and assuming additional wells spaced at 1/4 mile intervals would not increase the maximum near-field impacts (although far-field impacts would logically increase). The Cumulative Impact Analysis (Section 5.4) stated: "Modeling was also performed to predict potential air quality impacts from the proposed Moxa well fields in southwestern Wyoming. The three different groups of sources were modeled:

1) Emissions from the Moxa and Fontenelle well field development (worst case emissions inventory);
2) Other well fields identified in Section 3.0 (e.g., GWA II, Jonah Field, Stagecoach, Mulligan Draw, Creston/Blue Gap, and BTA/Bravo); and
3) Other sources in southwestern Wyoming that have undergone New Source Review (NSR) but have not been constructed or are not yet in operation."

The Cumulative Impact Analysis further states (Section 5.4.4) "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."

MOXA-FONTENELLE FEIS CONCLUSIONS

Anaco and the Sierra Club asked why do the Fontenelle Natural Gas Infill Drilling Projects (Fontenelle) FEIS and the Expanded Moxa Arch Area Natural Gas Development Project (Moxa) FEIS present different air quality impact conclusions when both analyses were based on the same Air Quality Technical Support Document (TRC, May 1996)?

The Commenters are correct. The air quality impact analysis is based on the Air Quality Technical Support Document, prepared under contract by TRC Environmental Corporation (May 1996). Their analysis concluded (Page ii):

- 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 (PSD) Class I and Class II Increments.
- Pollutant concentrations during production activity did not "overlap" from one well to another and the adjacent well fields in southwest Wyoming 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 Wilderness area. Construction activity is assumed to result in minor increases that will have 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 Wilderness area. Applying 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.

The "worst-case" emissions scenario represents 14,045 tons/year of nitrogen (NO) emissions from the Wyoming proposes Action; the "less conservative" emissions scenario represents 1,756 tons/year NOx emissions.

Based on a different set of analysis assumptions, the USDAs Forest Service concluded "there could be a
perceptible change in visibility on 158 days" under the "worst-case" emissions scenario, and "18 days would exhibit significant visual range reduction" under the "less conservative" emission scenario. The USDA-Forest Service also concluded "impacts would exceed applicable significance criteria in lakes with ANC's less than 25 microequivalents per liter" based on their level of "level of acceptable change" of zero additional impeding visual effects sensitive lakes systems. The USDA-Forest Service concurred with the other potential air quality impact conclusions. The Moza Arch FEIS included the USDA-Forest Service's conclusions in order to clearly present this information to the decision maker, and for public review. The Fontenelle FEIS did not contain the clarification because it had not been developed prior to release.

The Sierra Club asked why there are inconsistencies between the Fontenelle FEIS air quality analysis, and other previous natural gas development EIS's in southern Wyoming? What is the basis for different methodologies or assumptions?

The Fontenelle Project EIS was prepared as a separate impact analysis, under applicable Federal National Environmental Policy Act (NEPA) regulations (40 CFR 1500-1508). "Methodology and Scientific Accuracy" regulations (4 CFR 1502.24) direct that current, scientifically defensible data and methodologies form the basis for an EIS. The 'Air Quality Technical Support Document' (TRC, May 1996) was prepared by TRC on several similar natural gas development projects were under NEPA review simultaneously, and more recent data and methods were available.

WORST-CASE

Amoco and Independent Petroleum Association of Mountain States ask what is the reason for conducting a "worst-case" air quality impact assessment? What are the necessary mitigation measures required although no significant air quality impacts are predicted to result under "worst-case" scenarios? In assessing potential air quality impacts from Proposed Actions, the Bureau would prefer to identify, as precisely as possible, actual impacts from specific activities. However, it is rarely possible to have all the information necessary for such an assessment, and it is impossible to predict actual air quality impact based on the limited accuracy of air pollution modeling technology.

When issuing operating permits, air quality regulatory authorities consider this inherent inaccuracy by requiring specific model and input assumptions be used by an applicant. NEPA analyses are designed to provide the best possible impact assessment for consideration by the decision maker and for public review.

NEPA regulations (especially 40 CFR 1502.22 and 1502.24) recognize the need for using "worst-case" assumptions where an assessment of potential impacts is imperative, but "the means for obtaining it are beyond the state of the art." This procedure is based on the premise that if a project is evaluated under "worst-case" conditions, and it still predicts (or actually over-predicts) potential impacts below appropriate significant levels, then the project's impacts would actually be lower.

Unnecessary mitigation measures should not be required because the decision maker is aware of the "worst-case" assumptions applied, and their probability (or improbability) of occurrence.

SIGNIFICANT IMPACTS

Wyoming Outdoor Council, USDA-Forest Service and individual commenters Crane, Larson, Thomson, and Travers argue that the pollution emission levels reported in the Fontenelle FEIS, significant and adverse air quality impacts on visibility and lake chemistry are predicted in the Wind River Mountain wilderness areas. Why did the Fontenelle FEIS underestimate these impacts?

The Fontenelle FEIS did not underestimate potential air quality impacts. Based on the assumptions and methodologies described, the FEIS indicated that potential significant and adverse air quality impacts could occur in the Wind River Mountain wilderness areas under the "worst-case" emissions scenario, but these impacts were not predicted under the "less conservative" emissions scenario. No other significant air quality impacts (including lake chemistry) were predicted.

The USDA-Forest Service, using different assumptions and methodologies, predicted the "significant and adverse visibility and lake chemistry" impacts described by the commenters. The USDA-Forest Service's conclusions were provided to the Bureau decision maker for consideration in developing the Record of Decision.

The Sierra Club and individual commenters Hicks and Lindsey observe that the Bureau continues to ignore, dismiss and fight back against cumulative air quality impacts from proposed projects. Does the Bureau plan to destroy healthy air throughout Wyoming in order to develop the mineral resources of southwest Wyoming?

As directed by Congress, the Bureau is a "multipurpose" agency concerned with environmental protection and minerals development. Regarding air quality, the Bureau can not (under law and by policy) approve or conduct any action which does not comply with applicable local, state or Federal air quality laws, regulations, standards or implementation plans.

Amoco observes that the USDA-Forest Service has insisted the proposed Fontenelle project would result in significant impacts to Wind River wilderness area visibility and lake chemistry, yet no supporting documentation was included in the FEIS. Will the Bureau provide the supporting data for public review for evaluation of the USDA-Forest Service's analysis and conclusions?

The USDA-Forest Service's comments on the Fontenelle FEIS were included in the FEIS. In addition, the Bureau received several separate additional correspondences regarding their analyses, which are available for public review. However, no separate, specific air quality impact analysis (similar to the Fontenelle FEIS "Air Quality Technical Support Document") has been provided by the USDA-Forest Service.

NEPA PROCEDURES

Wyoming Department of Environmental Quality, L.P. & A. Trucking, and Sherwood Enterprises observe that the Wyoming Department of Environment (WDEQ; Air Quality Division) found the Fontenelle FEIS adequately addressed portal air quality impacts, no violations of Wyoming or Federal air quality standards are expected to occur, and WDEQ will require very specific pre-construction air pollution emission permits. Why doesn't the Bureau immediately approve the proposed natural gas projects?

NEPA regulations include specific periods for public review and comment. The Bureau is required to consider this wide range of comments and information prior to issuing a Record of Decision. A decision to deny, approve, or approve with conditions is issued as soon as practical.

The Sierra Club and Wyoming Outdoor Council believe the Fontenelle FEIS understates potential air quality impacts, based on a "flawed" flawed analysis, and lacks the complete and scientifically defensible information necessary to fully inform the public and decision-maker of environmental consequences before actions are taken. Therefore, the FEIS fails to meet the minimum standards and requirements of the National Environmental Policy Act (NEPA), Clean Air Act, Clean Water Act, Federal Land Policy Management Act, and other applicable laws and regulations. Why has the Bureau chosen to release the FEIS and respond to industry's requests to expedite a Record of Decision, rather than correct these deficiencies and meet its basic obligations under NEPA?

The Bureau has issued the Fontenelle FEIS under applicable NEPA regulations, not as claimed by the Commenters to "respond to industry's request to expedite a Record of Decision." The FEIS is not "flawed" it does not lack necessary "complete and scientifically defensible information," nor does it fail "to meet the standards and requirements of the National Environmental Policy Act (NEPA), Clean Air Act, Clean Water Act, Federal Land Policy Management Act, and other applicable laws and regulations.

TRC TECHNICAL REPORT

The Sierra Club believes the findings of the Fontenelle FEIS are based on the flawed Air Quality Technical Support Documents (TRC, May 1996). The TRC report was revised at least twice, responding to comments by the USDA-Forest Service, and has since been republished by the Bureau. Which version of the TRC report is the basis for the FEIS air quality impact assessment?

The Fontenelle FEIS air quality impact assessment is based on the "Air Quality Technical Support Document" prepared by TRC Environmental Corporation, and issued in May 1996. All other versions of this document were in "working draft" form, intended for internal Bureau review. This internal review included soliciting comments from the USDA-Forest Service, Environmental Protection Agency (EPA), and the Wyoming Department of Environmental Quality (WDEQ). We regret the
Commenter was confused because they inappropriately obtained a "working draft" document.

IMPACTS TO OTHER WILDERNESS AREAS

The Wyoming Outdoor Council points out that there are several additional Wilderness Areas in the Medicine Bow and Routt National Forests which could be impacted by air pollution from existing and proposed natural gas developments in southwestern Wyoming. In order to provide a complete analysis, why didn't the Fontenelle FEIS include these Wilderness Areas?
Given the measured meteorological conditions and the distances of these other Wilderness areas with respect to the existing and proposed development projects, any potential impacts would be much less than those predicted to occur in the Wind River Mountain Wilderness areas.

FAILURE TO ADDRESS USDA-FOREST SERVICE CONCERNS

The Wyoming Outdoor Council observes that although, several times over the years, Bridger-Teton and Shoshone National Forest personnel have requested adequate notice from the Bureau regarding energy and mineral development projects in southwestern Wyoming, they were not made aware of the Fontenelle DEIS until just days before comment period closed. Why did the Bureau elect to ignore these requests? Isn't the Bureau's failure to provide adequate notice, solicits and obtain comments, and make them available to the public and other review agencies in an EIS a violation of NEPA (40 CFR 1500.1a(1))? The Bureau has not ignored requests from the USDA-Forest Service to obtain notice of energy and mineral projects undergoing NEPA review. Proper notification was provided under NEPA regulations for both "scoping" (40 CFR 1501.7) and "inviting comments" (40 CFR 1503.1). The Bureau regrets that the USDA-Forest Service may not have learned about the Fontenelle DEIS in a timely manner through the normal channels. The Bureau has conducted and attended several meetings with many USDA-Forest Service personnel in order to specifically obtain their comments regarding the Fontenelle project.

The Wyoming Outdoor Council and individual commenters Harris and Puliter say that the supervisors of the Bridger-Teton and Shoshone National Forests have stated additional oil and gas development as analyzed in the Fontenelle FEIS will exceed established limits of acceptable change, and severely impact visibility and the chemistry in the Wind River wilderness areas of their administration. Despite ample opportunity, why didn't the Bureau include ALL USDA-Forest Service air quality comments (including the March 7, 1996 and May 28, 1996 letters) in the Fontenelle FEIS? This is an inexcusable and egregious violation of NEPA.

The Bureau received several correspondences from the USDA-Forest Service regarding the Fontenelle project air quality impact analysis. Some of these were in direct response to NEPA notification, which were included in the FEIS. Some were based on "working draft" versions of the "Air Quality Technical Support Document," and those comments were incorporated into the "Air Quality Technical Support Document" prepared by TRC Environmental Corporation for the Fontenelle FEIS.

The Wyoming Outdoor Council states that the Bureau has shamefully curtailed its earlier emissions of the Wyoming-Outside Forest Service air quality concerns by: greatly misinterpreting, misunderstanding, and rejecting them; attempting to discredit their analysis; and, pretending the problems identified do not exist. Why did the Bureau choose to go to great lengths to distort and dismiss the views of the USDA-Forest Service, rather than disclosing "all major points of view on the environmental impacts of the action?"

The Bureau did not "choose to go to great lengths to distort and dismiss the views of the USDA-Forest Service, all major points of view" as claimed by the Commenter. The Bureau conducted the air quality impact analysis with the available information and data required by NEPA. Although the Bureau could not embrace the USDA-Forest Service's analysis on potential visibility and lake chemistry impacts at Wind River Mountain Wilderness areas (based on the Bureau's obligation to "insure scientific integrity" under 40 CFR 1502.24), the Bureau has included the USDA-Forest Service's conclusions in the Monitor Arch FEIS and in the Fontenelle Record of Decision.

The Wyoming Outdoor Council and the Sierra Club state that although the USDA-Forest Service questioned both the analyses and conclusions presented in the Air Quality Technical Support Document (TRC, May 96), their comments were not included in the Fontenelle FEIS. Rather, the Bureau indicated to the public that the "Forest Service has reviewed and concurred in the results of that analysis" and that although "still subject to further comment ... , concurrence in the scope, content, and analysis procedure contained in the Technical Report was given." How can the Bureau justify this statement? Didn't the Bureau receive the USDA-Forest Service's comments letter?

As stated above, USDA-Forest Service comment letters on the Fontenelle FEIS were included in the FEIS. Also, as stated above, the Bureau received several correspondences from the USDA-Forest Service regarding the Fontenelle project air quality impact analysis. Most were based on "working draft" versions of the "Air Quality Technical Support Document," and those comments were incorporated into the "Air Quality Technical Support Document," although the comment letters were not published in the FEIS. Although the USDA-Forest Service has consistently questioned the Bureau's visibility and lake chemistry analysis methods and conclusions, they did concur in the Bureau's inclusion of their comments into the FEIS and consideration of their comments in the Record of Decision. Neither the Bureau, nor the USDA-Forest Service, has insisted on forcing all parties to adopt a single analysis.

BACKGROUND CONDITIONS

The Sierra Club states that the current level of industrialization in the Fontenelle project area already significantly impacts air quality.

This statement is not supported by either the Fontenelle FEIS Affected Environment analysis, nor by the "Air Quality Division", which has primary regulatory authority over air quality in Wyoming.

WDEQ/DEP RESPONSIBILITIES

The Independent Petroleum Association of Mountain States and Enbrook Enterprises observe that, as stated by a WDEQ representative, air quality issues in southwestern Wyoming are complex, prohibited in terms of permitting new emission sources of emissions. In addition, WDEQ will examine project specific air quality effects before the most cause very specific air quality preconstruction permits. These facts should have been emphasized in the Fontenelle FEIS.

It is true that WDEQ will review and issue applicable air pollution pre-construction and operating permits before air pollution emissions may occur. However, the Bureau is required to perform separate air quality impact assessments under NEPA and Bureau policy, for projects it either conducts or approves. These authorities, although parallel, are separate and must be conducted under applicable laws.

The Sierra Club pointed out that the Clean Air Act regulations require WDEQ to implement a long term strategy to prevent future impairment of visibility in the Fontenelle project area. The Bureau should therefore undertake measures to prevent visibility impairment, based on sound information and analysis.

The WDEQ, Air Quality Division (with EPA oversight), has the primary regulatory authority over air quality in Wyoming. The Bureau will comply with all applicable local, state and Federal air quality requirements, including visibility regulations.

The Greater Yellowstone Coalition and commenter Benson note that the Casper-Star Tribune reported (July 17, 1996) "in an internal memo, EPA officials regretted conclusions that the ___ Fontenelle natural gas project posed no threat to the air quality in NW Wyoming's specially protected mountainous and scenic areas." We expect the Bureau to respect EPA's concerns, and make the necessary changes in the future management of the Green River Basin. The only relevant question is will the Bureau permit any additional sources of air pollution?

No law, regulation or implementation plan prohibits the Bureau from conducting or authorizing any additional sources of air pollution. However, as a matter of law and by policy, the Bureau will comply with all applicable air quality requirements. In addition, the Bureau has both conducted and attended several meetings with EPA and USDA-Forest Service personnel regarding the Fontenelle project prior to completing the Fontenelle FEIS and Record of Decision. In fact, the USDA-Forest Service and EPA concern is the basis for the total NOX emissions cap of 977 tons per year from all emission sources within the Rock Springs District (including the Moa Arch, Fontenelle, Stagecoach Draw, and Jonah development projects).

FOREST SERVICE RESPONSIBILITIES

The USDA-Forest Service and commenter Benson note that under the Wilderness Act, Clean Air Act, H-8 H-9
This assertion is not true. The USDA-Forest Service’s “limits of acceptable change” are developed internally, and used as a basis for their review of air pollution emissions permits, NEPA analysis, or any other purpose they desire. The “limits of acceptable change” are not legally binding on the USDA-Forest Service, or any other entity. They can be revised at any time by the USDA-Forest Service, and they are not subject to NEPA review as a “major Federal action.”

Commenters Burland and Tressel assert that since the Bureau cannot legally violate USDA-Forest Service standards for visibility and water quality in wilderness, the Bureau should take steps at this stage to avoid conflicts. The Bureau is responsible, and has the authority, to maintain Wyoming’s clean air from impacts caused by minerals development, so why should it use it. Why does EPA need to get involved?

EPA has the oversight responsibility for Federal environmental laws, including the Clean Air Act and NEPA. WDEQ is responsible for implementing Federal and State specific air quality regulations. The Bureau can not violate any applicable local, state or Federal air quality regulations, but the USDA-Forest Service “limits of acceptable change” (including visibility and lake chemistry) are not binding standards. The Bureau is working with other entities to avoid these conflicts, but its actions must be based on, and authorized, by law.

COOPERATIVE STUDIES

The USDAs-Forest Service and commenter Benson note that surely the Bureau is required to work with other managers of Public Lands to help protect our resources.

The Bureau, USDA-Forest Service, and project proponents should meet with the Wyoming air quality regulatory agency (WDEQ) in order to: 1) establish a goal of no decrease in visibility, and no decrease in acid neutralizing capacity of sensitive lakes in the Wind River Mountain Wilderness areas; and 2) establish specific, enforceable impact thresholds.

The Bureau is very interested in cooperating with Federal, state and local governments, environmental advocates and industry representatives, and the general public to assure its actions help maintain good air quality in Wyoming. But this is a shared responsibility; no single entity can create, maintain, or protect air quality. And all governmental agencies must operate under the limited authorities granted to them under the law.

With respect to the Forestenze project Record of Decision, the Bureau is dedicated to working with several established cooperative air quality management bodies/studies, including: the Green River Basin Visibility Study Steering Committee; the University of Wyoming (EPISCORE) inter-state air pollution transport study; and, the southwestern Wyoming Air Quality Policy and Technical Committees.

ROD LANGUAGE

The USDA-Forest Service states that the Bureau should disclose the potential unacceptable air quality impacts to visibility and lake chemistry in Wind River Basin Wilderness areas in the Forestenze project Record of Decision. In addition, approvals should include the condition that if there are emissions increases, the polluting sources must reduce their emissions. Such an adaptive regulatory approach would allow development, and secure the USDA-Forest Service’s confidence, while ensuring that no adverse impacts will occur.

The Record of Decision does consider both the USDA-Forest Service’s comments regarding: potential visibility and lake chemistry impacts in the Wind River Mountain Wilderness areas; and, their recommended limit of NO2 emissions to 977 tons/year from new sources authorized by the Bureau, until this limit of potential impacts can be performed. The Bureau does not have legal authority to require approved sources to lower existing NO2 emissions, but the Bureau will cooperate with other interested parties to pursue the issue of NO2 emission offsets.

MITIGATION

The USDA-Forest Service and commenter Burland note that, in this age of scientific achievement, the Bureau can require mitigation that can eliminate air quality impacts (including acid rain), or can maintain impacts at negligible levels.

To the extent authorized by law, the Bureau can, and does, mitigate potential air quality impacts through required Record of Decision stipulations. However, the Commenters should not expect the Bureau to "eliminate air quality impacts" entirely; all human
During the NEPA process, the air pollution control requirements for proposed projects are determined by the Federal Register of Regulations (FRR). The NEPA process requires a comprehensive analysis of potential impacts on the environment, including air quality, water quality, and wildlife.
If the EPA thinks a broader "emissions cap," including all NOx emission sources, is both prudent and necessary in southwestern Wyoming (given "the rapid pace of oil and gas development in the region with potentially even larger cumulative impacts"), the EPA has the authority to require such a cap in the Wyoming "State Implementation Plan," or if WDEQ fails to act, EPA can prepare and implement its own "Federal Implementation Plan" NOx emissions cap.

The Environmental Protection Agency believes that the proposed 977 tons/year NOx emissions cap is an appropriate level based on currently available information, but an emissions cap less than 977 tons/year would provide a margin of safety for avoiding adverse impacts in the Class I areas.

As stated above, the Record of Decision has imposed a cap on NOx emissions of 977 tons/year. The USDA-Forest Service's recommended limit of NOx emissions to 977 tons/year from new sources authorized by the Bureau, until more comprehensive analysis of potential impacts can be performed. The Record of Decision also provides for a margin of safety in that "If total NOx emissions from future permit authorizations reach 972 tons per year (90% of cap), additional cumulative air quality environmental review will be conducted."

Unfortunately, many administrative requirements don't always directly benefit the environment.

The Environmental Protection Agency states that the ROD language must be enforceable or it will result in little or no mitigation of impacts from projects. NOx emissions offsets should be required if cumulative emissions increases from new, Bureau authorized, oil and gas developments exceed 977 tons per year.

The Record of Decision 977 tons/year NOx "emissions cap" is enforceable by the Bureau for Bureau authorized actions. The Bureau does not have legal authority to require approved sources to lower existing NOx emissions, but the Bureau will work with other interested parties to pursue the issue of NOx emission offsets.

The Environmental Protection Agency believes that the 977 tons/year cap should remain in effect until new monitoring/modeling studies are completed, and the Governor's Interagency Committee finds that a different emission threshold is appropriate. Subsequent projects could then be permitted using the new limits.

Your comments have been considered and the Record of Decision imposes a total NOx emissions cap 977 tons per year above levels existing as of May 1996 within the BLM Rock Springs District. The cap will remain in effect unless Interagency Committees on Air Quality, or other information source, provide recommendations, with supporting technical analysis regarding regional visibility impacts, demonstrating the emissions cap should be changed. This emission cap is binding only on future federal actions authorized on federal lands. As stated above, EPA has the authority to require a NOx "emissions cap" of their own design in the Wyoming "State Implementation Plan," or if WDEQ fails to act, EPA can prepare and implement its own "Federal Implementation Plan" NOx emissions cap.

The Environmental Protection Agency notes that limiting levels of NOx emissions to 977 tons/year will likely be accepted limits for visibility, but beyond the USDA-Forest Service's limits of acceptable change for acid neutralizing capacity of sensitive lakes, which creates the potential for changes to aquatic plant and animal community occurrence and distribution within these aquatic ecosystems.

The 977 tons/year NOx "emissions cap" is based on the USDA-Forest Service's emission analysis and recommendation. Although the Bureau could not embrace the USDA-Forest Service's lake chemistry impacts analysis (based on the Bureau's "future scientific integrity" under 1502.24), limiting NOx emissions to 977 tons/year would not cause significant impacts to lake chemistry in Wind River Mountain Wilderness areas. However, the Wyoming DEQ has agreed to encourage offsetting or reducing NOx emissions from proposed or existing activities when permitting new emission sources or processing permit renewals under Wyoming Air Quality Standards and Regulations within southwest Wyoming.

FUGITIVE DUST

The Greater Yellowstone Coalition and Sierra Club believe the TRC report does not appear to acknowledge any particulate impacts resulting from roads and vehicle traffic during production, nor from clearcut areas before they are successfully revegetated with native seed. Vehicle traffic will result in some hundreds of additional tons of particulate matter annually, and numerous mineral development sites and roads in southwestern Wyoming persist as sources of fugitive dust due to unsuccessful reclamation. This will result in measurable changes in particulate levels in the Wind River Wilderness areas. Therefore, the Bureau should provide better reclamation standards as well as better WDEQ enforcement of those standards.

The "Air Quality Technical Support Document" (TRC, May 1996) reported potential particulate matter emissions from truck traffic from each of the "well pad & resource road construction," "rigging & drilling," "completion & flaring" in Tables 2.1a and 2.1b. The largest predicted emissions occurred during the "well pad & resource road construction phase," which was the basis for the near-field particulate matter impact assessment. Particulate matter emissions from vehicle traffic during production would be negligibly small, when compared to the construction traffic. The analysis did not require must dust abatement, road surfacing, and reclamation procedures would be implemented as required by law.

The Wyoming Outdoor Council believes that the Bureau may be able to reduce dust by 50 percent on paper, but in reality, such control efficiencies are extremely optimistic, if not unrealistic, in the arid and windy project area. Nowhere in the Green River Basin have these control levels been achieved, or are they likely to be achieved. It is improper to rely on an "assumed" 50 percent control efficiency without demonstrating such levels are realistic and the likelihood of their attainment come from, and what evidence does the Bureau have that it can be achieved?

The Bureau is confident that fifty percent control efficiencies are reasonable and achievable based on standard engineering practices, as specified by WDEQ.

The Wyoming Outdoor Council contends that the emissions from scraping, trenching, and welding of the gathering systems were not considered in the Fontenelle FEIS. The air quality impact analysis also neglected to consider emissions from water trucks, well work-over, and other oil field related maintenance and inspection.

The impacts described would be less those analyzed for well field development, temporary and minor in nature.

HAZARDOUS AIR POLLUTANTS (HAPs)

The Wyoming Outdoor Council notes: the FEIS indicates a number of hazardous materials will be used during drilling, yet the FEIS fails to consider and identify emissions of hazardous air pollutants during the construction and drilling phase. Under the Clean Air Act Title III, the Bureau must evaluate the potential sources of 189 listed HAPs used in the Fontenelle project, and determine if they are "major" emitters (greater than 10 tons/year individually, or greater than 25 tons/year cumulatively).
The maximum emission of hazardous air pollutants was predicted to occur from the compressor engine, dehydrator, separator, and storage tanks during the production phase. Emission of hazardous air pollutants during the construction and drilling phase are expected to be less. Natural gas development operators are required to comply with Title III of the Clean Air Act regarding the potential release of hazardous air pollutants.

**MODELING PROCEDURES**

The USDa-Forest Service and the Wyoming Outdoor Council note that using a more conservative, consistent, and thorough modeling approach would have resulted in greater potential air quality impacts to the Wind River Mountain Wilderness areas than those shown in the FEIS. A more consistent approach used for the cumulative analysis would help; the Fontenelle DEIS used an assortment of techniques (some conventional and some unique). Given the mix of modeling methods used, it is difficult to evaluate the degree of conservatism.

The Commenters may have more experience reviewing regulatory permits applications, which either require specific model and input assumptions or apply a standard screening model. Certainly, a "more consistent" approach would have been easier to review, but would not have met the necessary NEPA requirements (under 40 CFR 1502.24).

The USDa-Forest Service states that it is clear from this project that the Wind River Mountain Wilderness areas would be impacted by the Fontenelle project. The analysis could be improved by adopting more appropriate modeling techniques.

The modeling techniques applied by the Bureau meet the assessment requirements of NEPA. The air quality impact analysis demonstrated the Fontenelle project (in combination with other existing and proposed emission sources) would impact the Wind River Mountain Wilderness areas. However, these impacts would be insignificant except for potential visibility impacts under the "worst-case" emission scenario. Using the "less conservative" emission scenario, no significant impacts are predicted to occur.

The USDa-Forest Service contends that the analysis method used is definitely not "worst-case" with regard to the use of deposition algorithms originally applied to radioactive materials. The selection of deposition velocities, based on average values from the literature, imply a more active surface sink than is likely in southwestern Wyoming. The conventional IWADM (Intergovernmental Work Group for Air Quality Modeling) deposition algorithms should be used.

The deposition algorithms used in the Bureau's air quality impact assessment meet the requirements of NEPA. Certainly, using more conservative algorithms would show greater impacts.

Intermountain Petroleum Association of Mountain States is concerned that the use of "worst-case" emissions scenarios as the basis for analysis are often taken out of context, and used to support negative biases against natural gas drilling projects.

The Bureau understands the basis for using "worst-case" modeling assumptions and methodologies, and the likelihood of potential air quality impacts. However, the Commenter is probably correct regarding several of the comments received on the Fontenelle DEIS and FEIS.

The Sierra Club believes that the Fontenelle FEIS understates the conservative nature of its calculations. The assumption of a 225 horsepower compressor at each well does appear to be an overestimate, but the analysis did not include any field compression, processing compression, or main line compression. It is unreasonable to assume that such compression will not be needed.

Given the amount of compression assumed under the "worst-case" and "less conservative" emission scenarios, no additional well field, processing, or main line compression would be needed.

**MODEL SELECTION**

The Sierrra Club notes that applying EPA's Climatological Regional Dispersion Model (CRDM), with the Fontenelle FEIS assumptions for NOx and VOC emissions, plus additional particulate matter emissions from production operations vehicles traffic, establishes there will in fact be significant impacts on the Wind River Mountain Wilderness areas from the Fontenelle and Mesa projects alone. The CRDM is intended to give probably, rather than "worst case," results, is an accurate predictor of actual concentrations, and its predictions cannot be interpreted to be overly conservative or a "screening analysis."

The modeling techniques applied by the Bureau meet the assessment requirements of NEPA, as reported in the Fontenelle DEIS and the "Air Quality Technical Support Document" (TRC, May 1996).

The USDa-Forest Service states that the Bureau should follow screening model procedures recommended by the Intergovernmental Working Group on Air Quality Modeling (IWADM) to predict potential air quality impacts from sources greater than 50 km distant. IWADM consists of EPA, State regulatory agencies and Federal Class I area managers, and can suggest procedures that are suitably conservative for the analysis. IWADM procedures must be followed for new PSD source permit applications. The IWADM screening model consists of: 1) a trajectory-based model, rather than the straight line "flashlight" approach (which generally overpredicts air quality impacts); 2) use of a wind-field distribution, rather than single location meteorological observations (the wind field generally lowers potential air quality impacts); except in mountainous terrain where local circulation and stagnation may increase specific receptor concentrations; and, 3) including within plant "deposited" or applied conversion processes (which always reduces the concentrations of primary, emitted pollutants while increasing secondary pollution concentrations).

However, the IWADM procedures may require more specific source information than was available for the Fontenelle FEIS.

The modeling techniques applied by the Bureau meet the assessment requirements of NEPA, as reported in the Fontenelle FEIS and the "Air Quality Technical Support Document" (TRC, May 1996). Since the Bureau has not been invited to participate on IWADM, the SIERRA Club states that IWADM screening procedures would have been adequate for this NEPA analysis. However, given the design of the screening procedures (intended for PSD Permit Application review), it probably would not have been appropriate.

**EMISSION SOURCES INCLUDED**

The Sierra Club and Wyoming Outdoor Council believe that although several natural gas projects on the east side of the Continental Divide (including Wamantaur II and Crestone/Blue Gap) were considered for individual project impact assessment, the Fontenelle FEIS failed to include the proposed Continental Divide and South Baggs projects. Without consideration of these projects, the Air Quality Technical Support Document (TRC, May 1996) statement "these totals reflect the maximum potential development" is incorrect. Why didn't the Bureau include these projects in its cumulative impact analysis, since they are not only proposed, but well into the NEPA process? The Continental Divide project was
included in the cumulative impacts analysis for the Greater Wamsutter II EIS. If the proposed Continental Divide Project was "reasonably foreseeable" with respect to one analysis, shouldn't it be with respect to another?

As stated above, the Continental Divide and South Bagg projects were specifically not included because at the time of this analysis, their likelihood was speculative, and including them would have appeared "pre-decisional." The decision of which proposed, but not operational, emission sources to include in a cumulative air quality impact must be made at the time of each analysis.

The Wyoming Outdoor Council contends that additional air pollution emission sources that are "permitted but not constructed," but could combine with Fontenelle/Fossil emissions should have been included in air quality impact analysis.

Air pollution emission sources that were "permitted but not constructed" were included in the cumulative air quality impact analysis, as described in Tables 3.1 and 3.3 in the "Air Quality Technical Support Document" (TRC, May 1996).

The Wyoming Department of Environmental Quality (WDQ) notes that Table 3.3 of the Fontenelle FEIS (Sources Permitted but Not Operating) is erroneous. It appears total facility emissions are listed for some sources rather than the portion of the plant emissions that have just been permitted (but not operating). All SO\textsubscript{2} emissions (except 964 tons/year from SF Phosphates) are existing emissions (including background). All Texassulf-Soda Ash and UPFR-Parrish Draw NO\textsubscript{x} emissions are existing (included in background), and were an over-estimate of 4,111 tons/year. And "Permitted but Not Operating" General Chemical, Western Gas Resources, Williams Field Service-Mona North, and Williams Field Service-Opal NGL Plant NO\textsubscript{x} emissions are over-estimated by 7,101 tons/year. Since FEIS modeled the emissions in the original Table, the text represents a conservative error.

The Bureau appreciates obtaining the most current, and accurate, information regarding these additional potential air pollution emission sources. Since the revised values are all lower than the values used in the air quality impact assessment, the impacts reported in the Fontenelle FEIS were over-estimated (conservative).

WIND TRAJECTORY

The Sierra Club notes that the Fontenelle FEIS wind field trajectory analysis may have excluded days when the initial wind direction was not toward the Wind River Mountain Wilderness areas. This would have resulted in underestimation of potential impacts. Did the trajectory analysis include all days?

The wind field trajectory analysis included a full year of observed wind directions and speeds.

The USDA-Forest Service notes that based solely on the wind trajectory analysis, it appears the project would impact the Wind River Mountain Wilderness areas. Air Quality Technical Support Document (TRC, May 1996) Figure 3-3 (Wind Trajectory plot) presents the end points of trajectories from the natural gas development area that either cross the boundary of the wilderness areas, or are allowed to extend 24 hours. With specific "puff model" was applied, and were local meteorology data used for a year, or multiple-year period? Although the results state "only 15 percent of the trajectories end in the wilderness," the National Forest boundary is visually outlined by trajectory end points.

The wind field trajectory analysis indicated that air pollution emissions would be transported into, and impact the Wind River Mountain Wilderness areas. However, the significance of such impacts can not be determined from the wind field analysis alone. A TRC wind-velocity trajectory analysis was applied, using hourly Craven Creek meteorology data for calendar year 1992. The reason the National Forest boundary is outlined in the analysis is that it is a "puff" crossed the boundary, its trajectory was stopped (therefore, low wind speed "puffs" were caught on the boundary, higher wind speed "puffs" crossed into the Forest boundary. [NOTE: Jim Zapert - please verify]

The USDA-Forest Service asks, since the report includes results from trajectory-based modeling, why not present the numerical results from those simulations, using parameters (e.g., AWCQIM screening techniques)?

The wind-vector trajectory analysis was run only to estimate the frequency of occurrence of impacts to the Wind River Mountain Wilderness areas. No pollutant concentration estimates were made.

ACID NEUTRALIZING CAPACITY (ANC) IMPACTS

Amoco notes that the Fontenelle FEIS atmospheric deposition modeling results predicted the maximum potential change in Acid Neutralizing Capacity (lake chemistry) to be less than the USDA-Forest Service 10 percent significance criteria (limit of acceptable change). Therefore the FEIS correctly concludes potential impacts would be below applicable significance criteria for atmospheric deposition.

This is correct, based on the air quality impact analysis performed, and scientifically defensible lake chemistry data (which did not indicate background ANC levels less than 25 \textmu q/l).

The USDA-Forest Service and commenter Boushy note that it is USDA-Forest Service policy to protect the most sensitive component of the ecosystem from potential air quality impacts, which in this case, would be lake ecosystems with ANC values below 25 \textmu q/l. The negative impacts on water quality, especially in the sensitive Wind River Range, may quickly harm aquatic features of that region. Modeled emissions from current proposed and future developments in southwest Wyoming exceed the "limit of acceptable change" of zero change for these sensitive lakes.

The Commenters' conclusion is based on an assumption that there are Wind River Mountain Wilderness lakes with ANC values less than 25 \textmu q/l, an assumption based upon a single measurement in 1985 during the EPA's Western Lakes Survey; not scientifically defensible lake chemistry data. The "sensitive" lakes do exist, the "level of acceptable change" is zero; any air quality degradation, no matter how small, would be significant.

The USDA-Forest Service and the Wyoming Outdoor Council note that Lakes with ANC less than 25 \textmu q/l were not analyzed in the Fontenelle FEIS, although the 1985 EPA Western Lakes Survey results indicate that lakes of such high sensitivity exist in the Wind River Mountain Range. The Bureau should recognize there is a high probability air quality impacts to extremely sensitive lakes would exceed the USDA-Forest Service's "limits of acceptable change" in the Wind River Mountain Wilderness areas.

As stated in the Fontenelle FEIS, the Bureau analyzed potential lake chemistry impacts for five lakes in the Wind River Mountain Wilderness areas. These data were provided by the USDA-Forest Service, and included a single 1985 ANC measurement below 25 \textmu q/l at Klondike Lake. Subsequent measurements of ANC have not been made at Klondike Lake. Based on a comparison of 1980 and recent data collected at Ross Lake (Barron 1996), the accuracy and representativeness of the single Klondike Lake value (and a similar Ross Lake value) is suspect. As stated above, assuming these "sensitive" lakes do exist, the "level of acceptable change" is zero; any air quality degradation, no matter how small, would be significant.

ACID NEUTRALIZING CAPACITY (ANC) MODELING

The USDA-Forest Service contends that the modeled deposition and computed change in ANC predicts significant, adverse impacts at Ross Lake (with a background measured ANC of 13 \textmu q/l).

Any air quality degradation, no matter how small, would be considered significant by the USDA-Forest Service for lakes with measured ANC values less than 25 \textmu q/l. However, based on a comparison of Ross Lake ANC data with Table 3.3 of the 1983 data and recent 1992 ANC data of 50 \textmu q/l, the analysis concluded "it is unknown if this apparent increase reflects a real change in lake chemistry, or is an artifact of changes in analysis procedures (Barron, 1996).

The USDA-Forest Service notes that the Air Quality Technical Support Document (TRC, May 1996) Table 6.2 (Computed Change in ANC) presents annual, not instantaneous direct lifetime impacts. Although projecting annual changes over the lifetime of the projects (20 years) would provide a worst case estimate, it would not be appropriate due to lake dynamics. The Bureau should use a different lake chemistry modeling technique to estimate impacts over project lifetime.

The modeling techniques applied by the Bureau meet the assessment requirements of NEPA, as reported in the Fontenelle FEIS and the "Air Quality Technical Support Document" (TRC, May 1996). At one time, the USDA-Forest Service offered to model lake chemistry changes, based on the Bureau's estimates of ambient pollutant concentrations. Unfortunately, the proposed MAGIC model, is proprietary, and
could not be made available for scrutiny under NEPA ( "Incorporation by reference" ) (40 CFR 1502.21) and "Commenting" (40 CFR 1503) requirements.

The USDA-Forest Service notes that similarly using annual pH changes is not a very conservative approach, because lakes are dynamic and accumulate impacts. The projected annual pH change could be quite different by the project lifetime (in years), in order to provide a worst case estimate of lake impacts. However, this estimate would overstate potential impacts because lakes will likely exchange their water contents completely during the project lifetime. The actual impact would likely be in between these two estimates. Another technique could be used to estimate the total project lifetime impact.

Given the overall conservativeness of the Bureau's air quality impact assessment, the modeling techniques applied meet the assessment requirements of NEPA, as reported in the Fontenelle FEIS and the "Air Quality Technical Support Document" (TRC, May 1996).

ACID NEUTRALIZING CAPACITY (ANC) MONITORING

Amoco notes that no long-term monitoring data indicate Wind River Mountain Wilderness area lake ANC values are less than 25 μeq/l. The USDA-Forest Service provided complete ANC data sets for five alpine lakes, exhibiting most ANC concentrations in excess of 60 μeq/l, and no data point below 25 μeq/l. Two lakes (Klöndike and Ross) had single point ANC values less than 25 μeq/l. The Klöndike measurement was made in 1984; no subsequent ANC measurements have been made there. The Ross Lake ANC was measured at 13 μeq/l in 1983 (at the same time the low Klöndike measurement was made). Long-term measurements taken from Ross Lake since 1983 indicate a minimum measured ANC of 50 μeq/l.

The need for ANC monitoring of "sensitive" lakes was evaluated by the USDA-Forest Service at their "Air Quality Technical Support Document" (TRC, May 1996). Potential in the Bridger and Fitzpatrick Wildernesses Workshop held March 14-15, 1984, at Colorado State University. One of the Workshop recommendations was: "At least one monitor lake in the 20-30 μeq/l alkalinity range should be established." If scientifically defensible lake chemistry data had indicated ANC levels less than 25 μeq/l, the Bureau would have used such data in the lake chemistry impact analysis.

The USDA-Forest Service notes that the Air Quality Technical Support Document (TRC, May 1996) indicates measured lake chemistry ANC values vary from year to year. It fails to indicate ANC values also vary throughout the year. The 1985 EPW Western Lakes Survey was designed to measure the lowest ANC throughout the lake's annual cycle in order to gauge the lake's greatest vulnerability. The fact that ANC values measured at different times of year is much a statement about the variability of the survey design as it is about the sensitivity of the lakes. However, a question remains about which measurements should be used to characterize lakes in the wilderness, the lowest measured ANC or some averaged value.

Given the lack of scientifically defensible measured ANC values below 25 μeq/l for any time period, the comment regarding seasonality is irrelevant. Clearly, the lowest, repeatable ANC measurements are appropriate to determine the significance of potential impacts.

The USDA-Forest Service notes that although local deposition data do not yet show a statistically significant trend (Burrell, 1996), they do suggest nitrogen deposition levels are increasing. The simple presence of increased measured deposition triggers the USDA-Forest Service response to "err on the side of protection," as their mandate.

The Bureau has not questioned the USDA-Forest Service's responsibilities or authority to establish their own "levels of acceptable change." However, the Bureau could not embrace the USDA-Forest Service's lake chemistry impacts analysis (based on the Bureau's obligation to "insure scientific integrity" under 40 CFR 1502.24).

The Greater Yellowstone Coalition believes that acid deposition studies on the aquatic life of lakes and streams of the Wind River Mountain Range and in Yellowstone National Park have already shown a decrease in pH and an increase in nitrogen oxides (NOx) during the past decade. We are particularly concerned about potential air quality impacts on the development of the park's aquatic ecosystems, which are located upwind, and this area's pollution is the largest contributor of acid deposition to the largest water body in the contiguous United States.

The Bureau recognizes this concern, but is required to base its air quality impact assessment on scientifically defensible data and methodologies. Based on the assumptions and methodologies described, the Fontenelle FEIS indicated that potential significant and adverse lake chemistry impacts would not occur, even under the "worst-case" emissions scenario.

HISTORICAL VISIBILITY

The Greater Yellowstone Coalition andcommenters Bourgoy, Hicks, Lindsey, and Springfield state that visibility has decreased significantly according to state studies, Finis Mitchell (whose photos of Wyoming's mountain ranges have exhibited an increased haze during the past decades) and other individual communities:

"Visibility is rarely clear and we're seriously concerned about where the smog is coming from to fog the air."

"In the past 30 years the clarity and visibility have already deteriorated severely."

"Having grown up in Wyoming, I personally, can attest to the deterioration of visibility of vistas from the State since energy development began in earnest in the 1970s."

As population and industrial air pollution emission sources increase, air quality impacts (including ambient air concentrations and visibility) will occur. Unfortunately, personal perceptions are not as accurate or precise as properly designed and operated monitoring instruments. Based on visibility monitoring conducted by the Bureau east-southeast of Parson, Wyoming (from 1987-1991) and by IMPROVE near Fremont Lake (from 1988 to date), no statistically significant visibility trends are evident.

VISIBILITY IMPACTS

The USDA-Forest Service and Wyoming Outdoor Council contend that the regional haze estimation techniques used in the Fontenelle FEIS are flawed, and represent serious underestimations of potential impacts. We strongly recommend that the visibility modeling analysis be corrected to include [VOC aerosols], a recent revision for the development document, which would improve the accuracy of the modeled changes, and by our calculations, increase predicted visibility impacts by 2-3 times. By including these corrections (except VOC aerosols), the natural gas development projects would exceed USDA-Forest Service visibility "limits of acceptable change" as follows: under the "Worst-Case Emissions Scenario" 42 percent of the days each year have greater than 0.5 degree impact and 27 percent of the days each year have greater than 1.0 degree impact; under the "Less Conservative Emissions Scenario" 5 percent of the days each year have greater than 0.5 degree impact.

The visibility impact modeling techniques applied by the Bureau meet the assessment requirements of NEPA, as reported in the Fontenelle FEIS and the "Air Quality Technical Support Document" (TRC, May 1996). Based on a different set of analysis assumptions, the USDA-Forest Service concluded "there could be a perceivable change in visibility on 158 days" under the "worst-case" emissions scenario, and "18 days would exhibit significant visual range reduction" under the "less conservative" emission scenario.

The Fontenelle FEIS Record of Decision has included the USDA-Forest Service's conclusions in order to clearly present this information to the decision maker and for public review.

DECIVEY

Amoco notes that the USDA-Forest Service visibility analysis uses a 0.5 degree significance threshold ("limit of acceptable change") versus the 1.0 degree value used in the Fontenelle FEIS. The 1.0 degree change is used as a criteria for significance by IWQMD, the Grand Canyon Visibility Transmission Commission, and other visibility-related researchers. The USDA-Forest Service, on the other hand, has provided the reader with nothing, technically supporting the 0.5 degree change as an established criteria for significance. The Fontenelle FEIS indicates that assuming a "worst case" emissions scenario, eliminating days exceeding an average relative humidity of 68 percent, and applying a threshold of 1.0 degree, natural gas operations would result in a perceptible visual range reduction on twenty six (26) days annually. Under the "less conservative" emissions scenario, no days exceed the 1.0 degree visual impact development scenario, but with 2% of days eliminated for relative humidity and a threshold of 0.5 degree, the Forest Service analysts would conclude a perceivable change in visibility on 153 days. Under the "less conservative" emissions scenario, 18 days would exhibit significant visual range reduction.
The Bureau has not questioned the USDA-Forest Service's responsibilities or authority to establish their own "levels of acceptable change." However, the Bureau could not embrace the USDA-Forest Service's visibility impacts analysis (based on the Bureau's obligation to "assure scientific integrity" under 40 CFR 1520.24). The Bureau used a significance level of 1.0 deciview, as proposed by Pitchford and Malmaeus, "Atmospheric Environment," Vol. 28, No. 5, pp 1049-1054, 1994). and defined as "about a 10 percent change in extinction coefficient, which is a small but perceptible scenic change under many circumstances." The 1.0 deciview value corresponds to a 2 to 5 percent change in contrast, for a "black target" against a clear sky, at the most optically sensitive distance from an observer.

Nevertheless, the Bureau, in the acknowledgement of the USDA-Forest Service's concern, has imposed a cap on new federally authorized sources of NOX, emissions until the Interagency Committees or other source provides a basis for changing the cap.

The USDA-Forest Service notes that Regions 2 and 4 have established a "limit of acceptable change" in visibility from manmade causes at 5 percent or 0.5 deciview reduction. Some agencies have used a change of 10 percent or 1.0 deciview. It would be hard to find consensus that the United States in 1997 has reached a total number of days per year on which the 0.5 and 1.0 deciview change is reached or exceeded.

Based on a different set of analysis assumptions (including a 0.5 deciview "level of acceptable change"), the USDA-Forest Service concluded "there could be a perceptible change in visibility on 158 days" under the "worst-case" scenario, and "40 days would exhibit significant visual range reduction" under the "least conservative" scenario.

The Fontenelle FEIS Record of Decision has included the USDA-Forest Service's conclusions in order to clearly present this information to the decision maker and for public review.

**VOLATILE ORGANIC COMPOUND (VOC) AEROSOL**

The Sierra Club states that the Bureau failed to include the effects of VOC emissions in determining potential visibility impacts. The Fontenelle FEIS dismissed these impacts stating the VOC impact cannot be readily modeled. This is simply incorrect. Groinens and Sinfield (1991) quantified the fractional aerosol coefficients of various organic species. Among those VOC's that convert to aerosols are toluene and xylene, which are emitted in significant amounts by natural gas production operations. Although the fraction of these VOC's that convert to aerosols is low, the particulates can have disproportionate impact on visibility because of their small size. Based on potential volume and volume, the potential for formation of VOC aerosols on visibility in the Wind River Wilderness areas is very substantial. Failure to acknowledge these impacts is a real disservice to both the public and to decision making.

The visibility impact modeling techniques applied by the Bureau meet the 0.99 deciview impact, which is very close to the "noticeable" level.

The Bureau has not questioned the USDA-Forest Service's responsibilities or authority to establish their own "levels of acceptable change." However, the Bureau could not embrace the USDA-Forest Service's 0.5 deciview "level of acceptable change (based on the Bureau's obligation to "assure scientific integrity" under 40 CFR 1520.24). The Bureau used a significance level of 1.0 deciview, as proposed by Pitchford and Malmaeus, "Atmospheric Environment," Vol. 28, No. 5, pp 1049-1054, 1994), and defined as "about a 10 percent change in extinction coefficient, which is a small but perceptible scenic change under many circumstances." The 1.0 deciview value corresponds to a 2 to 5 percent change in contrast, for a "black target" against a clear sky, at the most optically sensitive distance from an observer.

Nevertheless, the Bureau, in the acknowledgement of the USDA-Forest Service's concern, has imposed a cap on new federally authorized sources of NOX, emissions until the Interagency Committees or other source provides a basis for changing the cap.

Based on a different set of analysis assumptions (including a 0.5 deciview "level of acceptable change"), the USDA-Forest Service concluded "there could be a perceptible change in visibility on 158 days" under the "worst-case" scenario, and "18 days would exhibit significant visual range reduction" under the "least conservative" scenario.

The Fontenelle FEIS Record of Decision has included the USDA-Forest Service's conclusions in order to clearly present this information to the decision maker and for public review.

The Bureau has not questioned the USDA-Forest Service's responsibilities or authority to establish their own "levels of acceptable change." However, the Bureau could not embrace the USDA-Forest Service's 0.5 deciview "level of acceptable change (based on the Bureau's obligation to "assure scientific integrity" under 40 CFR 1520.24).

**PERCENT RELATIVE HUMIDITY**

The Wyoming Outdoor Council and the USDA-Forest Service believe the Bureau should include all levels of relative humidity when predicting potential visibility impacts (as outlined in their Interagency Monitoring of Protected Visual Environment, or IMPROVE, protocols), and not just when relative humidities are less than 68 percent. "Zeroing" the potential visibility impacts when the daily average relative humidity exceeds 68 percent seriously underestimates both the degree and frequency of impacts. There is no reason to invalidate higher relative humidity factors. IMPROVE requires that at least 15 hourly relative humidity samples occur every 24 hours. Although the correction term is exponential (not logarithmic), there is no reason to invalidate relative humidity correction factors above 68 percent. The factors are based on the work of Tang, et al. (1980), which are peer reviewed and used by IMPROVE.

The visibility impact analysis conducted for the Fontenelle FEIS assumed the following: 1) seasonal, meteorological conditions, 2) no fog or smoke would occur on every day of its "season;" 3) these clean days would have clear skies (not impacted by clouds or precipitation); 3) the constant 24-hour ambient primary and secondary particulate matter concentrations would occur throughout the sight path, and be constant all day; 4) this aerosol growth would occur based on measured daily average relative humidity (as reported by Tang, et al., 1980), homogeneous throughout the atmosphere, regardless of ambient temperature; and, 5) calculated changes would be compared to a 1.0 deciview significance threshold. These are several compelling conservative assumptions.

The Bureau chose to limit particle growth due to moisture at 68 percent relative humidity. This is highly unlikely that clear sky, 90th percentile (clean) days would occur in southwestern Wyoming when the daily average relative humidity exceeds 68 percent. Higher relative humidity conditions will be associated with cloud formation and precipitation.

In addition, the Tang growth curves were developed at constant temperatures, representing absolute humidity (aerosols grow when surrounded by water, not "potential" water). Higher relative humidity conditions in southwestern Wyoming will produce less particle growth than lower, relative humidity conditions.

The Bureau has not questioned the USDA-Forest Service's responsibilities or authority to establish their own "levels of acceptable change." However, the Bureau could not embrace the USDA-Forest Service's 98 percent relative humidity limit (based on the Bureau's obligation to "assure scientific integrity" under 40 CFR 1520.24).

Nevertheless, as stated above, the Bureau, in acknowledgement of the USDA-Forest Service's concern, has imposed a cap on new federally authorized sources of NOX, emissions until the Interagency Committees or other source provides a basis for changing the cap. Also, the Fontenelle FEIS Record of Decision has included the Bureau's own conclusions in order to clearly present this information to the decision maker and for public review.

The Sierra Club, Wyoming Outdoor Council, and the USDA-Forest Service have their own "levels of acceptable change". However, the Bureau used the wrong standard for determining whether impacts to visibility in the Wind River Mountains Wild and Scenic River Corridor are "noticeable." The use of a 1.0 deciview significance level in the Fontenelle FEIS is contrary to USDA-Forest Service guidelines which specify a 0.5 deciview "Limit of Acceptable Change (LOC)." The Grand Canyon Visibility Transport Commission stated "a one to two deciview increment change in air quality related visibility is insignificant." Pitchford and Malmaeus, (1994), cite 0.5 deciview as the lower bound for a "Just Noticeable Change." The use of 0.5 deciview by the Bureau is highly unlikely to be acceptable because it is well below the 0.99 deciview impact, which is very close to the "noticeable" level.

The Bureau has not questioned the USDA-Forest Service's responsibilities or authority to establish their own "levels of acceptable change." However, the Bureau could not embrace the USDA-Forest Service's 0.5 deciview "level of acceptable change (based on the Bureau's obligation to "assure scientific integrity" under 40 CFR 1520.24).
There is no evidence cited in the Fontenelle FEIS that these periods occur only when fog or rain obscures visibility; visibility under these conditions is much more efficient at scattering light at high humidities, excluding high humidity days without cause, and results in a significant underestimation of impacts to the Wind River Mountain Wilderness areas.

As stated above, the Bureau limited its visibility impact analysis to periods where daily average relative humidity was 68 percent or less, based on the assumptions that potential impacts were being calculated for 90th percentile (clean) days which would not exhibit significant cloud growth or precipitation. The visibility impact modeling techniques applied by the Bureau meet the assessment requirements of NEPA, as reported in the Fontenelle FEIS and the "Air Quality Technical Support Document" (TRC, May 1996).

**RELATIVE HUMIDITY CORRECTION FACTORS**

The Wyoming Outdoor Council and USDA-Forest Service contend that the Bureau should use an accepted method to compute relative humidity correction factors for predicting potential visibility impacts. Instead, the Bureau used a statistically inappropriate method to compute the relative humidity correction factors, which will underestimate the true relative humidity correction by roughly 20 to 50 percent (depending on season and choice of relative humidity cutoff). At a direct result, the visibility impacts will also be underestimated by 20 to 50 percent.

The Bureau utilized available relative humidity data (18 daytime hours daily) to calculate daily average relative values. This data limitation would underestimate the daily, 24-hour average relative humidity values, but does represent the daytime conditions for which potential visibility impacts were predicted. The significance of this underestimation would be less than that suggested by the USDA-Forest Service because of its more conservative assumptions (regarding VOC aerosol, 98 percent relative humidity limits, and 0.5 deciview "level of acceptable change").

**DAYTIME RELATIVE HUMIDITY**

The USDA-Forest Service believes that using only daytime relative humidity values also underestimates the visibility correction factors, because nighttimes conditions typically have the highest relative humidities. If only daytime relative humidity values are available, the USDA-Forest Service has appropriate seasonal correction factors based on more than four years of IMPROVE Bridge monitoring station relative humidity data.

Since the potential visibility impacts were calculated on a daily basis, using daily average relative humidity values concurrent with the meteorological modeling data is appropriate.

**VISIBILITY EMISSION SOURCES**

The USDA-Forest Service notes that sources which are "permitted but not constructed," and in the same area as the Fontenelle projects should be included in the visibility analysis.

The visibility analysis was conducted to determine potential reductions in the measured 90th percentile (clean) days which did not include sources "permitted but not constructed." If these sources were included in background, the 90th percentile (clean) day would have been hazier, and the significance of the "worst-case" and "less conservative" emission sources would have been less. Therefore, the visibility analysis was conservative.

**MONITORING**

The Greater Yellowstone Coalition and commenter Kunkel believe that an independent agency should regularly monitor the air quality in the affected areas to better insure that all environmental quality standards are being maintained. There is no routine air quality monitoring program established in southwest Wyoming to assess the effects of emission levels, which include its gas processing plants, two coal-fired power plants, four coal mines (only one is underground), and 27 oil and gas fields.

The Bureau recognizes the need for reliable and complete air quality monitoring data to determine conditions, trends, and effectiveness of air quality management activities. The WDEQ, Air Quality Division (with EPA oversight), has the primary regulatory authority over air quality (including monitoring) in Wyoming. The Bureau does not have legal responsibility to monitor air quality throughout southwestern Wyoming, but the Bureau will cooperate with other interested parties to obtain scientifically defensible data.

The Greater Yellowstone Coalition believes that the Bureau and WDEQ should coordinate an air quality monitoring program with the USDA-Forest Service and National Park Service, in order to alert the agencies when problems are occurring and thereby avoid serious acid deposition problems downwind in the future.

As stated above, the Bureau is very interested in cooperating with Federal, state and local governments, environmental advocates and industry representatives, and the general public to assure good air quality is maintained in Wyoming. But this should be a shared responsibility. Perhaps one of the several established cooperative air quality management bodies/studies could address monitoring needs, including: the Green River Basin Visibility Study Steering Committee; the University of Wyoming (EPSCOR) inter-state transport study; and, the southwestern Wyoming Air Quality Policy and Technical Committee.

The USDA-Forest Service believes that monitoring can be conducted to ensure that air quality impact thresholds are not exceeded in the Wind River Mountain Wilderness area, once an improved modeling analysis is performed, assuring the land manager that no adverse impacts will occur.

The Bureau is willing to cooperate with the USDA-Forest Service to obtain scientifically defensible data.

**CUMULATIVE EFFECTS**

The Wyoming Outdoor Council contends that there are still many serious questions concerning the impacts of this project (and others in the Basin) on air quality related values in the Wind River Mountain Wilderness area that must be addressed before this project may be allowed to proceed. By issuing the Fontenelle FEIS that lacks full and fair discussion of the USDA-Forest Service's comments, and by not providing the public with an opportunity to review those comments in an DEIS (along with the Bureau's and other agencies' responses thereon), the Bureau only compounds its original mistake of not involving the USDA-Forest Service early in the environmental review in the process, and shows its disregard as a "development agency" interested only in facilitating the exploitation of the nation's energy reserves regardless of the potential impacts on the other uses and values of our public lands and resources.

As directed by Congress, the Bureau is a "multiple-use" agency concerned with environmental protection and mineral development. Regarding air quality the Bureau can not (under law and by policy) approve or conduct any action which does not comply with applicable local, state or Federal air quality laws, regulations, standards or implementation plans.

The Bureau has not questioned the USDA-Forest Service’s responsibilities or authority to establish their own air quality impact analysis procedures. However, the Bureau could not embrace the USDA-Forest Service’s visibility and lake chemistry assumptions (based on the Bureau’s obligation to "insure scientific integrity" under 40 CFR 1502.24)

Finally, the air quality impact assessment conducted by the Bureau meets the assessment requirements of NEPA, as reflected in the Air Quality Technical Support Document (TRC, May 1996).
watersheds, the viewsheds, the biological boundaries (such as the habitat of the Sublette antelope herd unit), and other reasonably foreseeable activity in these affected areas.

BLM maintains that a programmatic EIS is not necessary prior to approving continued oil and gas mineral development of the Fontenelle Project or other existing developments within southwest Wyoming. As discussed in the FEIS, the Fontenelle area (specifically the cumulative impact study area) has been a center of oil and gas production for over 70 years; as such the proposed infill drilling projects constitute the continuation of a resource use which has coexisted with other resource uses such as cattle grazing, wildlife use, petrolium wood collecting and transportation. Proposed infill drilling would take advantage of existing roads to minimize new disturbance that may be introduced by the construction of new access roads. Similarly, the impacts of surface disturbance would be reduced by using 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).

The resources adversely affected by the Fontenelle Projects are largely separate from those affected by other projects in southwest Wyoming. For example, much of the Fontenelle Projects would be constructed upstream of Fontenelle Reservoir which traps sediment that may be 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. Thus, the boundaries of the cumulative impact study areas touch does not dictate a relationship between the two sets of projects.

As BLM guidelines provide, it is not practical to analyze the cumulative impacts of a specific project on an individual basis. Rather, the guidelines require that the analysis be based on the resource complexity of the area in which the impacts of the proposed action will be felt and on the degree of other activity in that area. Additive impacts were considered and included as if they were the related given resource being addressed. Interactive impacts were addressed separately as they were not necessarily included as such. For example, the Fontenelle Project affected only the Sublette antelope herd, as did the other existing and proposed activity in the CSA (Stagecoach Draw and Jonah project areas) affected by the Fontenelle Projects. There is no interactive impact between the Sublette antelope herd and the West Green River antelope herd unit (Moxa Arch project area). Thus, the cumulative impact analysis area did not include the herd unit west of the Green River.

The proposed activities analyzed in the Fontenelle EIS are not connected with proposed oil and gas activities in the Moxa area or in other parts of southwest Wyoming. Infill drilling projects in the Fontenelle, Moxa 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 Fontenelle infill drilling projects will in no way result in a commitment to proceed with any other oil and gas project in southwest Wyoming; nor would it prejudice review, analysis or BLM decisions regarding other projects in the region.

BLM has agreed that review of the regional, cumulative impact of the projects initially proposed under the BLM guidelines, now under way in southwest Wyoming is warranted. For this reason on February 8, 1995 BLM announced that it had begun the Southwest Wyoming Resource Evaluation (SWWRE) of the 16.5 million acre area (nearly 25,780 square miles) encompassed by the regional evaluation includes the Fontenelle Projects (DALEN and Lincoln Road project areas). However, BLM believes that it is inappropriate to conduct, as part of an EIS intended to address the impacts associated with a specific set of infill drilling program, an extensive and detailed programmatic review of regional impacts.

BLM’s SWRE will determine whether cumulative environmental impacts are occurring that have not been projected and considered in existing land use plans. One of the goals of the evaluation is to determine at what level environmental protection that has been provided by existing resource management plans, lease stipulations, area-wide conditions of approval, or amendment of the land use plans) will be prepared if there are indications that substantial impacts are going unaddressed under the existing management framework. Preparation of a programmatic EIS without a review and analysis of past land use management effectiveness would be premature.

BLM believes that the SWRE being conducted on its land use plans in southwest Wyoming, will document how well the public has been involved each other. For example, the Fontenelle Project affected only the Sublette antelope herd, as did the other existing and proposed activity in the CSA (Stagecoach Draw and Jonah project areas) affected by the Fontenelle Projects. There is no interactive impact between the Sublette antelope herd and the West Green River antelope herd unit (Moxa Arch project area). Thus, the cumulative impact analysis area did not include the herd unit west of the Green River.

development and industrialization of southwest Wyoming, and wildlife and recreational uses afterward). The FEIS will identify where BLM needs to make changes in its mitigation and monitoring standards, areas that should be added, areas that are not protected from managed, and add areas that it has not already identified, etc.  

3. SOCIOECONOMIC/RECREATION

The National Wildlife Federation and Sierra Club Legal Defense Fund expressed concern that the Fontenelle EIS only focused on the socioeconomic factors associated with the oil and gas royalty revenue stream. It did not attempt to quantify any deleterious impacts to economies associated with recreation and tourism. This is inconsistent with the BLM’s Southwest Resource Evaluation which has found that effects of development and tourism to local economies as significant. The affected area is very popular to the hunters, anglers, hikers, horseback riders, and wildlife of Wyoming. We strongly disagree with the perception of the NEPA documents that loss of resources important to these people is inevitable in the face of oil and gas development. We strongly encourage BLM to fulfill their mission to manage these federal lands for the benefit of all the public.

The EIS did not intend to minimize the regional or state-wide significance of recreation activity or as an activity with substantial economic returns for the State and local communities. Rather, the EIS attempted to offer some measure of the quality of recreation opportunities currently found in the cumulative impact area, which impact the quantity of recreation activities. In terms of recreation, the DEIS notes that, while the Fontenelle areas itself is used for hunting and other motorized, dispersed recreation activities, it does not provide high quality or particularly noteworthy hunting opportunities and, aside from rockhounds looking for petrified wood within the Blue Forest area, certainly is not considered a recreation destination for tourists or an area that provides recreation opportunities of a regional or national significance that would attract such uses as hiking or horseback riding. Fishing is a high recreational use on Fontenelle Reservoir, but the public Fontenelle Reservoir field operations will not adversely impact this use.

When considering local recreation or hunting opportunities, the respondent should consider that oil and gas development has occurred in the cumulative impact study area for over 70 years and the fact that much higher quality opportunities are found less than an hour drive from the cumulative impact study area. Furthermore, the economies of nearby towns such as Big Piney, LaBarge and Marbleton are directly tied to oil and gas production. This industry also makes an important contribution to the state’s economy. A poll reported in the Casper Star-Tribune (October 10, 1995) found that an estimated 77 percent of the State “supported the development of more natural gas in Southwest Wyoming.”

The Sierra Club refutes BLM’s statement that “much higher quality hunting and recreation opportunities are found less than an hour drive from the cumulative impact study area.” They contend that:

“The reality is that if one drove from the Fontenelle Project area for an hour in nearly any direction there is sport fishing, dispersed recreation on sprouting walls, covered with stakes and survey tape, or under NEPA review for a natural gas project. There is no ‘elsewhere.’ BLM is developing it all, and all at the same time.”

BLM appreciates the Sierra Club’s perception and concern. However, BLM believes that the author(s) is mistaken about or unfamiliar with the public land areas surrounding the Fontenelle Projects or BLM’s land use plans including this area. 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 current development will be “indefinite” that is development within existing fields. Also, the Fontenelle Projects projections for natural gas development, oil and gas production, and timber development levels for environmental impact analysis purposes. The actual level of new well development is simple because it is easy to quantify royalties rather than evaluate the dispersed contributions of recreation and tourism dollars for local economies.”

The Wildlife Federation points out that the BLM Southwest Resource Evaluation Travel and Outdoor Recreation Report (Decembr 1995) showed that recreation and tourism to local economies as significant. The Wildlife Federation states that: 

“The FEIS fails to account for the contributions simply because it is easy to quantify royalties rather than evaluate the dispersed contributions of recreation and tourism dollars for local economies.”

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Coalition expressed concern about the narrow focus of the analysis area. By not including the Mesa Arch proposed project area in the cumulative analysis area, they believe some misleading conclusions are drawn and full impacts are not revealed. For example, they are concerned about increased wildlife mortalities from vehicles and illegal hunting and believe these mortality factors have not been adequately addressed in the NEPA analysis. They maintain that if displacement projects are allowed to be carried out in the project area, there is no assurance that these displaced animals will be adequately replaced. Therefore, they argue that the cumulative impact analysis would have to be redone to accurately quantify the combined impacts and benefits of multiple projects.

See also response to Comment #1. BLM maintains that its basis for establishing the Cumulative Impact Study Area was appropriate. BLM's publication "Guidelines For Assessing and Documenting Cumulative Impacts" (April 1994) was used as a guide in selecting the CISA. The physical boundaries of the Fontenelle Project area due to local recreational activities included the biological boundaries (such as the habitat of the Sublette antelope herd unit), and other existing and reasonably foreseeable activity in these affected areas. For example, the Fontenelle project affected only the Sublette antelope herd, as did the other existing and proposed activity in the CISA (Stagecoach Draw and Jonah project areas) affected by the Fontenelle Project. There is no interactive impact between the Sublette antelope herd and the antelope herd unit (Mesa Arch project area). Thus, the cumulative impact analysis area did not include the herd unit west of the Green River.

BLM also maintains that the Fontenelle Draft and final EISs adequately inform the decision-maker and the public of the cumulative impacts attributable to "maximum", "worse case" development in existing oil and gas fields in the Fontenelle area. BLM also maintains that the EIS for the Fontenelle drill projects adequately addresses effects on wildlife populations and habitat.

Displacement of wildlife (pronghorn antelope, mule deer and sage grouse) from roads and production locations was considered in the wildlife models. Displacement would be greatest during construction and drilling but would be minimal during field operations. Little traffic disturbance or displacement is associated with road and construction related activities. For example, Wildhorse models indicated that animals would habituate to this low level human disturbance (see Bromley 1985).

BLM believes that the EIS has not underestimated the significance of potential wildlife mortality factors such as illegal hunting and vehicle collisions. The potential for this to be a concern is low. The day of the rogue well field worker/poacher is gone. This is the reality of today's wild land workers and the people, who are just as concerned about protecting the wildlife as the environmental organizations. The probability of well field vehicle-wildlife collision mortalities being totally speculative, and FLMA has very low. There is no documentation that this is a problem.

The mountain plover is not a Federally-listed species, although it is being considered for listing, so it will receive listed species attention. The BLM has the concern that development in the West Green River area of the Jonah project area may give rise to the proposed actions, given the RPsAs and the avoidance and minimization measures contained in the Jonah Project Record of Decision (ROD), will not adversely affect Federally-listed or candidate species. The ROD requires the implementation of protective measures to ensure that the proposed activities do not accelerate the need to list the mountain plover (see Appendix A, Section II.2-14).

Several commenters were concerned that implementation of the Fontenelle Project would result in the establishment of a single-use designation for the area. The Sierra Club states that under FLPMA and NEPA, it is illegal for BLM to manage these lands for single-purpose use.

This statement is incorrect. The EIS did not quantify contributions of recreation and tourism dollars generated from the Fontenelle Projects area simply because, as stated above, the Fontenelle area, although used for hunting and other motorized, dispersed recreation activities, does not provide high quality or particularly noteworthy hunting opportunities and, aside from rockhounds looking for petrified wood and wildlife watchers, it is not considered a recreation destination for tourists or an area that provides recreation opportunities of regional or national significance that would attract such uses as hiking or horseback riding. Fishing is a high recreational use on Fontenelle Reservoir, but the Fontenelle Project fields operations will not adversely impact that use. Recreational uses within the Fontenelle Projects area are low.

The BLM Southwest Resource Evaluation Travel and Outdoor Recreation Report referred to pertains to all of southwest Wyoming. The Fontenelle Projects area is .76 percent and the CISA area is 3.7 percent of this area. However, the recreation revenue generated from the public lands west of southwest Wyoming is due primarily to visitors with a destination of Flaming Gorge National Recreation Area and by those passing through on their way to Yellowstone National Park. A calculation of the revenue generated from these public lands west of southwest Wyoming would be totally speculative and minuscule compared to the revenue generated from the recovery of the natural gas resource. The multiple uses associated with the use of the natural gas to replace coal in coal fired power plants or replace liquid gas burned in automobiles would also have to be factored into the comparison.

As the EIS stated, oil and gas activity has occurred in the Fontenelle Project areas for many years. While not all public lands uses have co-existed with this development (e.g., wilderness recreation), in accordance with FLMPA (Sec. 103(i)), management of public lands within the Fontenelle Projects 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 (e.g., petrified wood collecting), and rights-of-way are not excluded but will continue to co-exist with the natural gas development.

4. WILDLIFE/MULTIPLE-USE MANAGEMENT

The National Wildlife Federation, Sierra Club, Wyoming Outdoor Council, and Yellowstone
development that would occur within the Forenelle Projects will continue to provide for "multiple-use".

The Wildlife Federation is concerned that there is lack of credible, effective and committed mitigation for wildlife.

Every effort has been made to identify reasonable mitigation of impacts on wildlife and wildlife habitat. This was accomplished within the framework of the Federal Land Policy and Management Act (FLPMA). BLM maintains that its Record of Decision to implement the Forenelle Projects is fully consistent with the FLPMA definition of multiple-use. Certain impacts associated with oil and gas development are inherent to accommodating "multiple-use". Impacts from surface disturbance, human activity, facilities, visual intrusion, etc., are a necessary part of natural gas development. In addition, given the BLM administrative requirements and conditions of approval, the required mitigation measures and monitoring requirements contained in Appendix A, the additional site-specific environmental review documented on the form contained in Appendix B, the implementation of the Road Development plan contained in Appendix C, implementation of the well location modifications incorporated into the RPA documentation, the Forenelle Projects are fully consistent with the FLPMA definition of multiple-use. BLM maintains that its assessment is appropriate. The DEIS states at 4-42, "Project construction and operations could affect the quality of some dispersed recreational experiences (e.g., hunting) by increasing traffic, producing noise and dust and by adding production facilities to the landscape. However, these impacts would occur away from the centers of recreation use--Seedskadee NWRF, the Green River and Forenelle Reserve." The DEIS states at 4-43, "If mitigation and monitoring, as discussed above are implemented, the projects would make a negligible contribution to existing impacts on locally, regionally or nationally significant recreation resources." the BLM incorporates the specified mitigation.

As explained in the response to comments on the draft DEIS, all drilling is proposed within Seedskadee National Wildlife Refuge. Heavy truck traffic would not use U.S. Fish & Wildlife Service roads. No road construction is proposed within Seedskadee National Wildlife Refuge and no new access points to the Green River are proposed. Under the RAPs, the closest well, road or pipeline would be located at least 0.25 miles from the boundary of Seedskadee NWRF and would average about 0.75-1.0 mile or more from the Green River where it passes through the refuge. Under the RAPs, directional drilling would be used to avoid impacts to the Green River and reduce impacts within other sensitive surface resource areas.

5. GREEN RIVER/SEEDSKADEE NATIONAL WILDLIFE REFUGE (NRW)

Wyoming Outdoor Council is concerned about the impact to the Green River and Seedskadee National Wildlife Refuge. Wyoming Outdoor Council disagrees with BLM's recreation impacts. They believe they are understated.

BLM maintains that its assessment is appropriate. The DEIS states at 4-42, "Project construction and operations could affect the quality of some dispersed recreational experiences (e.g., hunting) by increasing traffic, producing noise and dust and by adding production facilities to the landscape. However, these impacts would occur away from the centers of recreation use--Seedskadee NWRF, the Green River and Forenelle Reserve." The DEIS states at 4-43, "If mitigation and monitoring, as discussed above are implemented, the projects would make a negligible contribution to existing impacts on locally, regionally or nationally significant recreation resources." the BLM incorporates the specified mitigation.

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6. INDUSTRIALIZATION OF SOUTHWEST WYOMING

The Yellowstone Coalition and Sierra Club believe that the BLM Rock Springs office projects authorized in the past year have transformed southwestern Wyoming into a highly industrialized area significantly interfering with other uses and causing impacts on game herds, air quality and other resources. They feel that land use conversions from activities such as well pads, roads, pipeline and powerlines corridors, and mines have left scars and are not accepbly reclamed.

Federal policy (FLPMA) regarding multiple use management of the public lands obviously differs from the respondents interpretation. The respondents appear to interpret oil and gas development as industrialization. Neither the Forenelle Projects development, nor other development projected to occur within southwest Wyoming, would convert the landscape to one considered heavily industrialized. In accordance with FLPMA (Sec. 103 (I)), the management of the public lands within the Forenelle Projects area would occur in a manner that ensures that the principal and major uses are not excluded, but rather will continue to co-exist with each other. Yes, evidence of mass presence will be visible for decades after field abandonment. But this is one of the trade-offs we must accept in the "multiple-use" management of the public lands, the management and utilization of the public lands and their various resources "in the combination that will presently present and future needs of the American people" i.e., to provide a clean energy source to help correct air pollution problems in large metropolitan areas and wilderness areas of the United States.

The total area within southwest Wyoming presently developed for resource extraction (i.e., coal, uranium, trona, and oil and gas production) occupies about 12.5% 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 "infilled" development within existing fields. Also, the Forenelle Projects projections for natural gas development are merely "maximum" or "worst case" development levels for environmental impact analysis purposes. The actual level of new well development is difficult to predict and would be dependent upon a range of factors. Surface geology associated with the formation being developed is a principle controlling factor. It is a know fact that the formation is not homogeneous or a continuous reservoir. Some successes will be expected on a pre-arranged grid of wells. The likelihood that the projected levels of development will be reached is truly remote.

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As of the date of DEIS preparation, the number of wells that had been drilled in the CISA was 1,420 wells, 1,070 of which were classified as active (i.e., were producing, shut-in, or temporarily abandoned) (DEIS page 1-1). Of the 1,420, 421 wells (rounded down from 1,423 wells) were included in the BLM's assessment of the CISA, 659 (the 907 not the 907's) were producing. Table 3-2, "Total Oil and Gas Wells Drilled in Each Township in the Cumulative Impact Study Area by Decade", provides the accurate breakdown of well status. The well numbers used for the Forenelle Projects area in evaluating the environmental impacts, including air impacts, is the 901 FEIS figure.

7. NUMBER OF WELLS UNCLEAR

The Wyoming Outdoor Council is unclear as to the number of wells in the Forenelle area. The DEIS (at i) indicates that there are "1,070 wells presently active" in the 179,760-acre natural gas field. The FEIS states (at i-1) that the number of active wells is 907 wells. Which figure is correct? And was the correct figure used in evaluating the environmental impacts from the proposal, particularly air impacts?

The DEIS (4-39 through 4-48) has adequately assessed the potential impacts from increased sediment loading with implementation of the Forenelle Projects. Implementation of the erosion control measures specified in the EIS and contained in the ROD, including DEQ-Water Quality Division's Stormwater Pollution Prevention Plans, will prevent all off-site flow of sediment from construction sites. This will provide the necessary protection to avoid impairment of designated waters. The DEQ-Water
10. LEAK DETECTION

The Wyoming Outdoor Council believes a monitoring and leak detection system is needed in response to the Wyoming DEQ's concerns about potential discharges from condensate tanks and other project facilities. A leak detection system is not required nor is it necessary. The provisions contained within the ROD will ensure protection of both ground and surface water (see Appendix A, Section II.2.3, Section III, Section IV.1C and IV.2, and Appendix D). The provision of daily activities by the BLM Inspection and Enforcement personnel. These measures satisfy DEQ's concerns.

11. GREEN RIVER IS A NATIONAL RECREATION RESOURCE

Wyoming Outdoor Council believes Green River is a National Recreation Resource because certain segments of the Green River have been designated a "blue ribbon" fishery of national importance by the Wyoming Game and Fish Department. The statement in the FEIS (BLM comment 10-26) that "the Fontenelle area is not considered a recreation destination for tourists or an area that provides recreation opportunities of regional or national significance" is patently false.

Thank you for your comment. Yes, a "blue ribbon" (or Class I) fishery is interpreted as having national significance by the Wyoming Game and Fish Department.

12. WETLANDS AND FLOODPLAINS

The Wyoming Outdoor Council would like a commitment from BLM to avoid authorizing construction in wetlands and floodplains. Please explain (citing any applicable criteria) the circumstances that might make avoiding wetlands and floodplains not feasible, and provide Wyoming Outdoor Council records demonstrating compliance with EO 11990 and 19948 for wells located in wetlands and floodplains in the Fontenelle area, and advance written notice of wells proposed in such areas.

As provided for in the ROD (Appendix A, Section 1), implementation will be in compliance with Executive Orders 11990 and 11948. Any new oil and gas activities will be conducted in compliance with all applicable Federal laws and regulations.* (Emphasis added.) BLM welcomes the participation of any interested parties.

13. TRANSPORTATION PLANNING

The Wyoming Outdoor Council believes that because the EIS did not review specific rights-of-way for the transportation and pipeline components, it is premature for BLM to be conducting NEPA analysis for this aspect of the project. The site-specific analysis to be performed later will produce the necessary information.

They feel this will ensure that access roads and pipelines are known, involves only the BLM's operators, consultants, engineers, and contractors. They feel the public is "conspicuously absent" from site specific environmental review addressing road location and design, resource conflicts, drainage considerations, and other important considerations. The public has a right under NEPA to be provided with a meaningful opportunity to participate in the development and review of road plans for DAKEN and Lincoln Road projects. They feel that transportation planning should not be the sole purview of engineers and contractors. They feel that because of the lack of public scrutiny over this aspect of oil and gas development on public lands in southwest Wyoming, "it's no wonder that road and pipeline projects have emerged as a major concern in this area".

The public has always had the opportunity to be involved and to provide meaningful participation and input into the development and review of road plans. However, not many have taken advantage of this opportunity. Every Application for Permit to Drill (APD), which includes consideration of associated access roads and pipelines, is posted for 30 days to allow interested public the opportunity to comment on the proposed application. Also, as provided for under Oil and Gas Orders, 1, 1E, 1F, 1H, 111, III 1990, WyomingOutdoor Council records demonstrating compliance with EO 11990 and 19948 for wells located in wetlands and floodplains in the Fontenelle area, and advance written notice of wells proposed in such areas.

The average disturbance used for roads in the DEIS and FEIS are accurate. The assumptions used in the DEIS for roads within a well field, as explained in FEIS Appendix D (pages 6 and 13), typically involve a construction disturbance width of 50 feet for Collector Roads, 46 feet for Local Roads, and 40 feet for Resource Roads. After reclamation of the road oustide, ditch and backspall, the remaining disturbance is typically 28 feet for a collector road, 24 feet for a local road, and 18 feet for a Resource Road. The DEIS unreported roadway width of 28 feet is an average to existing and new disturbance associated with roads within the well field. The DEIS on page 2-9 states, "Most of the new roadway and associated roadway will be designed access individual well sites [Resource Roads]. A well developed road network presently exists in most portions of both project areas. Thus, the assumption is actually quite conservative. Since the 28 FEIS width is the width associated with a Collector Road and the majority of new roads will be Resource Roads with a remaining disturbance width of 18 feet. There are no well road constructed within the Fontenelle Projects area with a graded area that is "100 feet or more in width". Existing County roads may approach this width.

The Wyoming Outdoor Council asks BLM to explain the difference between the Fontenelle EIS well pad disturbance of approximately 2.5 acres (DEIS at 2-3) and the Mesa Arch FEIS (at 1-2) well pad disturbance of approximately 5 acres.

The acres disturbed by well pad construction depend on terrain and area of cut-and-fill required at each individual drill site location, the depth of the well, safety considerations, and individual operator application of construction and drilling practices unique to their operations. The estimated area of disturbance associated with the Fontenelle well pad (DEIS at 2-3) of 2.5 acres assumes a 7,000 to 9,000 foot well, reals, pads, and well-top spoil stockpile area but little or no spoil stockpiling anticipated. The estimated area of disturbance associated with the Moxa Arch well pad (DEIS at 2-6), which has 7,100 foot disturbed area of project is 3.4 to 3.67 acres, assumes an 11,000 to 12,000 foot well (requiring more pad area for storing more drill pipe and casing pipe), topsoil and spoil stockpiling areas adjacent to the well pad, a completion flare pit outside the well pad, and assumes "maximum" or "worst case" scenario (i.e., well pad, cut-and-fill slopes, larger reserve pits, and ancillary disturbance) averaging 5 acres.

15. NO NET INCREASE IN ROADS

The Wyoming Outdoor Council believes that BLM should uphold and enforce "no net increase in roads policy" on public lands in the Green River Basin. They propose the "for every new mile of project-related road constructed, a mile of existing road should be obliterated and reclaimed to a condition that existed prior to disturbance".

Thank you for your recommendation. BLM will give consideration to the adoption of such a policy in the future. The Wyoming Outdoor Council recommends that the net increase in roads, as specified in the Fontenelle Projects ROD, be reviewed for each project to ensure the obliteration and reclamation of existing roads within the Fontenelle Projects area not Section III. Section III of the ROD, consideration for the obliteration and reclamation of existing roads within the Fontenelle Projects area is not required for project operations, living operator access, or for recreation access will be identified as an integral part of implementation of both Transportation Planning and the Wildlife Protection and Impact Mitigation Plan.
16. RECLAMATION GOAL

The Wyoming Outdoor Council feels that BLM’s present “reclamation goal of stabilizing soil and achieving cover is only the first step in successful reclamation. BLM must develop ... and implement meaningful reclamation standards that restore disturbed land to its highest previous use and to original contours. Specific criteria that address factors in addition to soil stabilization and cover) must be developed to assess reclamation success, such as species composition and diversity, and habitat value and function.”

The Fontenelle Projects ROD (Appendix A Section H.3.4, Section III, Section IV.4-D, and IV.2-L) provides specific reclamation requirements including stabilization, recontouring, and reclamation success monitoring. As the DEIS at 4.84 recognizes, restoration of the disturbed sagebrush-dominated vegetation may take decades to regenerate following construction, especially if subjected to drought and heavy grazing. Although the structural component of shrub-dominated habitats would recover slowly, successful restoration of seeded herbaceous vegetation may improve forage for wildlife within a relatively short time. Thus, areas to predisturbance composition, diversity, habitat value and function will occur over time and following field abandonment.

17. CUMULATIVE IMPACT WITHIN CISA

The Yellowstone Coalition disagrees with BLM’s conclusion in the DEIS (at 4-9) that the Fontenelle Projects “… when added to existing and reasonably foreseeable development is not expected to have a cumulative effect on transportation, recreation, visual, cultural, noise, geology, paleontology, groundwater, floodplain, soils, grazing, wetland/riparian, and threatened, endangered and species of concern”. They feel this statement contradicts the DEIS (at 3-1) statement that “Human activity, including oil and gas development, has had a profound, long-term impact on the natural environment of the CISA.”

The DEIS statement at 3-1 relates to the listed resources within the Fontenelle Projects CISA. The DEIS statement at 4-9 relates to the listed resources outside the CISA. The cumulative effects of the Fontenelle Projects, coupled with the Stagecoach Draw and Jonah projects were assessed for all of the listed resources within the CISA. However, the Fontenelle Projects coupled with the Stagecoach Draw and Jonah projects would not cumulatively affect the listed resources outside the CISA.

18. SAGE GROUSE

The Wyoming Game and Fish Department expressed concern that significant disturbance to sage grouse leks is occurring. Their records show that there was a lek in T24N, R110W, northeast quarter of Section 19 which has been mapped lek location located at T24N, R110W, NE 1/4 of Section 19. The closest lek is located in T24N, R110W, NW 1/4 of the SE 1/4 Section 20. As required by Onshore Order No. 1, well location permitting requires an on-site environmental review and a site specific EA. The preliminary review of BLM records and the on-site environmental review did not reveal sign of sage grouse use. BLM map data is based upon digitized WQFD data of lek locations provided to the BLM by the WQFD Cheyenne Office. BLM coordination with the Green River Office of the WQFD indicated that the location provided BLM may not have been correct, but that there was a well now located on the area which was once used as a lek by sage grouse. The WQFD is in the process of using GPS (Global Positioning System) to locate leks to ensure that the locations are accurate. BLM, WQFD and the Operator will work together to identify opportunities to mitigate impacts to the lek.

19. PETRIFIED WOOD COLLECTION AREA

The American Lands Access Association (ALAA) and 34 of their members expressed concern that the Blue Forest Petrified Wood Area would become unavailable and/or lost to oil and gas development. Concerned that the placement of well pads, access roads, and pipelines within and through the 500 to 600 acre Blue Forest petrified wood site. The commenters have asked that development be restricted within this area for the purpose of protecting the recreational opportunities of usevestate rockhounds to collect on public lands. They feel the area is small and would not interfere with the Operators ability to fully recover any gas underlying the wood area by locating wells outside the petrified wood area.

In response to this concern, the Fontenelle Projects ROD identifies the Blue Forest petrified wood area as an area which will continue to be open on a first use basis for collection in limited quantities. Well pads, access roads, pipelines, and any other facilities proposed within this area will be located to avoid degradation of the petrified wood area and interference with the recreational collection of this resource.