

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

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**Environmental Assessment for the Madden Deep  
Unit No. 9 Groundwater Monitoring Wells**



**PREPARING OFFICE**

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# **Environmental Assessment for the Madden Deep Unit No. 9 Groundwater Monitoring Wells**

**Prepared by  
U.S. Department of the Interior  
Bureau of Land Management**

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# **Chapter 1. Purpose and Need for Action:**

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## **1.1. Introduction:**

This Environmental Assessment (EA) has been prepared to analyze and disclose the environmental consequences of the Burlington Resources Oil and Gas Company, L.P. Madden Deep Unit No. 9 Groundwater Monitoring Wells Project as proposed by Burlington Resources Oil and Gas Company, L.P. (Burlington). The EA is a site specific analysis of potential impacts that could result with the implementation of a proposed action or alternatives to the proposed action. The EA assists the BLM in project planning and ensuring compliance with the National Environmental Policy Act (NEPA), and in making a determination as to whether any “significant” impacts could result from the analyzed actions. “Significance” is defined by NEPA and is found in regulation 40 CFR 1508.27. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of “Finding of No Significant impacts” (FONSI). If the decision maker determines that this project has “significant” impacts following the analysis in the EA, then an EIS would be prepared for the project. If not, a Decision Record (DR) may be signed for the EA approving the selected alternative, whether the proposed action or another alternative. A DR, including a FONSI statement, documents the reasons why implementation of the selected alternative would not result in “significant” environmental impacts.

## **1.2. Project Area Description:**

Burlington Resources Oil and Gas Company, L.P. (Burlington) filed a Sundry Notice with the Bureau of Land Management, Lander Field Office. The Sundry Notice for the Madden Deep Unit No. 9 Groundwater Monitoring Wells was received on September 10, 2013. The specific proposal is to install seven groundwater monitoring wells at the Madden Deep Unit No. 9 gas well location in Section 32, Township 39 North, Range 90 West, on BLM Federal oil and gas lease WYW-78561.

The proposed project area is in the Madden Deep Unit, approximately two miles northeast of Lysite, Wyoming, in Section 32, Township 39 North, Range 90 West, 6th P.M., Fremont County, Wyoming. The wells are administered by the Bureau of Land Management Lander Field Office, located in Lander, Wyoming.

## **1.3. Purpose of the Proposed Action:**

The purpose of this proposed action is for BLM to process the request (Sundry Notice) for Burlington (as operator) to explore and develop the oil and gas reserves within Federal mineral lease WYW-78561; to fulfill the valid and existing oil and gas lease; and provide for the sale of developed minerals. Specifically, 43 CFR 3101.1-2 states, “The lessee shall have the right to use so much of the leased land that is necessary to explore for, drill for, mine, extract, remove and dispose of all the leased resource in a leasehold...” Consistent with these rights, the lessee has filed a Sundry Notice to install seven groundwater monitoring wells. Any hydrocarbons product derived from this action would help meet the public’s demand for this product. The decision to be made is whether to approve or reject Burlington’s Sundry Notice for the Madden Deep Unit No. 9 Groundwater Monitoring Wells Project. Design Features and procedures are included in the EA, Stipulations and Conditions of Approval (COA).

## **1.4. Need for the Proposed Action:**

The need for action is reflected in BLM's role in permitting of exploration and development of federal oil and gas leases by private industry, including transport and delivery of produced oil and gas. The requirement to act in consideration of a Sundry Notice is an integral part of the BLM's oil and gas program under authority of the Mineral Leasing Act of 1920 as amended; the Mining and Minerals Policy Act of 1970; the Federal Land Policy and Management Act of 1976; the National Materials and Minerals Policy, Research and Development Act of 1980; and the Federal Onshore Oil and Gas Leasing Reform Act of 1987. BLM is directed by guidance, statute, and regulation to describe the environment of area(s) to be affected or created by alternatives under consideration.

## **1.5. Conformance to BLM Land Use Plan(s):**

The Proposed Action is subject to the Lander Resource Management Plan (RMP), approved on June 9, 1987. The Lander Field Office, as required by 43 CFR 1610.5, has determined that the Proposed Action conforms to the decisions, guidelines, terms and conditions as described in the Final Environmental Impact Statement and Record of Decision of the Lander RMP.

## **1.6. Relationship to Other Statutes, Regulations or Plans:**

This Environmental Assessment is being prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended. The authority for the Sundry Notice is the Mineral Leasing Act of 1920, as amended and supplemented (30 U.S.C. 181 et seq.), and the Federal Onshore Oil and Gas Leasing Reform Act of 1987. The Sundry Notice has been submitted in conformance to Department of the Interior and Bureau of Land Management (BLM) regulations.

An Environmental Impact Statement (EIS) is being prepared for the Moneta Divide Natural Gas Project in order to analyze the potential environmental impacts associated the expanded natural gas development that was proposed by the operators of the three units. This project was originally proposed as the Gun Barrel, Madden Deep, and Iron Horse Unit (GMI) Natural Gas Project EIS. BLM allows for continued exploration and some development activities on federal surface and minerals as authorized under the Council on Environmental Quality (CEQ) Regulations and 40 CFR 1506.1. An Interim Drilling Plan (IDP) for the GMI Project area was developed according to these Regulations and additional criteria, with the purpose of establishing guidelines for drilling and development within the GMI Project area boundary. This project is located within this boundary and BLM is applying Conditions of Approval to the Sundry Notice to conform within the scope of the Moneta Divide (GMI) EIS analysis, while also preventing impacts to resources that could limit the range of alternatives within the Moneta Divide Natural Gas EIS.

## **1.7. Identification of Issues and Resources:**

BLM is directed by guidance, statute and regulation to describe the environment of area(s) to be affected or created by alternatives under consideration. CEQ regulations direct BLM to concentrate efforts on attention to important issues, especially the presence or absence of the potentially significant resources presented in Table 1. All areas presented in Table 1 were considered, but many were not determined pertinent to the proposed action or affected to a degree of any importance, and therefore were not carried forward for further analysis. If particular resources are not affected beyond minimal amount, or if the resource is not present, there will be

no further discussion of the resources in the Affected Environment (Chapter 3), or in any of the subsequent impact analysis. The discussion of these environmental impacts is therefore restricted to topics related to resources which are affected and carried forward for analysis.

**Table 1.1. Potentially Significant Resources**

<b>RESOURCE</b>	<b>GUIDANCE OR AUTHORITY</b>
<b>Floodplains</b>	EO 11998; 10 CFR 1022
<b>Wetlands</b>	EO 11990; 10 CFR 1022, CEQ 1508.27(b)(3)
<b>Threatened, endangered, or candidate species and/or their critical habitat, and other special status (e.g., state-listed) species</b>	CEQ 1508.27(b)(9)
<b>Prime or unique farmland</b>	7 USC 4201; CEQ 1508.27(b)(3)
<b>State or national parks, forests, conservation areas, or other areas of recreational, ecological, scenic, or aesthetic importance</b>	CEQ 1508.27(b)(3)
<b>Wild and Scenic Rivers</b>	16 USC 1271; CEQ 1508.27(b)(3)
<b>Natural resources (e.g., vegetation, rangeland, soils, minerals, fish, wildlife, water bodies)</b>	CEQ 1508.8
<b>Coastal Zone areas</b>	16 USC 1451 et seq.
<b>Property of historic, archeological, or architectural significance (including sites on or eligible for the National Register of Historic Places and the National Registry of Natural Landmarks)</b>	EO 11593; CEQ 1508.27(b)(3)(8)
<b>Native American Concerns</b>	EO 13007
<b>Minority and low-income populations (including a description of their use and consumption of environmental resources)</b>	EO 12898
<b>Migratory Birds</b>	EO 13186

## **1.7.1. Identified Relevant Issues and Resources:**

### **1.7.1.1. Climate, Climate Change and Air Quality:**

Potential impacts to climate and climate change have been identified in Instruction Memorandum No. 2008-171 to include analysis of climate change in Environmental Assessments. Potential temporary (14 to 21 days) impacts to air quality during the project construction related activities, and long-term (20+ years) impacts for the duration of the wells' operating lives were identified.

### **1.7.1.2. Soils:**

Potential loss of soil stability and fertility and increase in soil compaction could exist from soil disturbance activities and heavy truck and equipment activities in the project area.

### **1.7.1.3. Vegetation Including BLM Wyoming Special Status and Noxious/Invasive Plants:**

Potential loss of vegetative cover and ecological diversity, and increase in noxious/invasive plants in the project area could be caused by direct impacts from construction activities and indirect establishment of noxious/invasive plants from seed sources by vehicles traveling to and from the project site.

The BLM Wildlife Biologist determined that suitable habitat for BLM Wyoming Special Status Plant Species, Porter's Sagebrush and Owl Creek miner's candle exists in the project area. Habitat for these species shall be avoided and disturbance minimized, where possible.

#### **1.7.1.4. Wildlife Including BLM Wyoming Special Status Species:**

The BLM Wildlife Biologist determined that no suitable habitat for Threatened and Endangered Species exists in the project area.

The project area is not located within BLM Wyoming Greater Sage-Grouse Core Area. However, suitable habitat for BLM Wyoming Special Status Species, greater sage-grouse exists in the project area. Other BLM Wyoming Special Status Species that may be present in the project area include ferruginous hawks, burrowing owls, white-tailed prairie dogs, migratory birds and sagebrush obligate bird species (i.e. sage thrasher, loggerhead shrike, sage sparrow and Brewer's sparrow). Habitat for these species shall be avoided and disturbance minimized, where possible. The Design Features and Stipulations described in Chapter 2.2.2.1 would provide mitigation measures to prevent significant adverse impacts to these species.

Protective measures for migratory birds are provided pursuant to the Migratory Bird Treaty Act (MBTA), 16 U.S.C. 703, and Bald and Golden Eagle Protection Act (BGEPA), 16 U.S.C. 668. Other fish and wildlife resources are considered under the Fish and Wildlife Coordination Act (FWCA), as amended, 16 U.S.C. 661 et seq., and the Fish and Wildlife Act of 1956, as amended, 16 U.S.C. 742a-742j.

Under the MBTA and BGEPA, the BLM has a mandatory obligation to protect the many species of migratory birds, including eagles and other raptors which may occur on lands under its jurisdiction. Measures included in the project Design Features that will reduce or eliminate adverse impacts to migratory birds include protective buffers, seasonal restrictions, and maintenance of habitat within the project area. Protective measures for migratory birds and general wildlife implemented in the Design Features detailed in Chapter 2 pursuant to the MBTA, BGEPA and FWCA will provide mitigation protection in the project area for greater sage-grouse, migratory birds and sagebrush obligate bird species.

The BLM Wildlife Biologist determined that suitable habitat exists in the project area for BLM Wyoming Special Status Species, white-tailed prairie dogs. However, the proposed action will not result in any disturbance to active prairie dog towns, so no stipulation is being applied.

#### **1.7.1.5. Groundwater:**

The depth to groundwater in the project area is approximately 30 to 50 feet (Wyoming State Engineer's Office, 2013). There is a potential for aquifer drawdown and sedimentation during drilling operations and installation of the groundwater monitoring wells. The Design Features described in Chapter 2.2.2.1 would prevent significant adverse impacts to groundwater resources.

*Chapter 1 Purpose and Need for Action:  
Identified Relevant Issues and Resources:*

## **1.7.2. Resources Considered But Eliminated From Further Analysis:**

### **1.7.2.1. Floodplains:**

No Floodplains were observed or identified in the project area.

### **1.7.2.2. Prime or Unique Farmland:**

No Prime or Unique Farmlands were observed or identified in the project area.

### **1.7.2.3. Wild and Scenic Rivers:**

No Wild and Scenic Rivers were observed or identified in the project area.

### **1.7.2.4. Coastal Zone Areas:**

No Coastal Zone Areas were observed or identified in the project area.

### **1.7.2.5. Minority and Low-Income Populations:**

No determination was made regarding the minority and low-income populations of this action. The project area is located in an unpopulated area.

### **1.7.2.6. State, or Natural Parks, Forests, Conservation Areas, or Other Areas of Recreational, Ecological, Scenic or Aesthetic Importance:**

No areas relating to these criteria were observed or identified in the project area.

### **1.7.2.7. Vegetation Resource Threatened and Endangered Species:**

A BLM Wildlife Biologist conducted a vegetation clearance of the project area and determined that no Threatened, Endangered, or listed species or habitats are present in the project area.

### **1.7.2.8. Rangeland Resources:**

The Proposed Action was reviewed by a BLM Range Specialist and it was determined that no impacts would occur to rangeland facilities or to grazing activities by this action.

### **1.7.2.9. Socioeconomics:**

No determination was made regarding the socioeconomics of this action. A Wyoming State Treasurer's report indicated federal mineral royalty distribution to local and state governments exists, but there is not scientific analysis that can project how this will have a beneficial or adverse impact to local, state, or federal communities or governments.

**1.7.2.10. Visual Resources:**

The project area occurs in a Visual Resource Management Class IV designation. The objective of Class IV designation is to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.

**1.7.2.11. Geology:**

No special Geological Areas or concerns were observed or identified in the project area.

**1.7.2.12. Wetlands:**

No wetlands were observed or identified in the project area.

**1.7.2.13. Surface Water:**

The closest source of surface water is Badwater Creek, approximately 2.0 miles southeast of the project area. Mitigation in the form of erosion control structures will be installed to prevent the movement of sediment off the project area, drainages, or roadways. The Design Features described in Chapter 2.2.2.1, along with the would help prevent erosion, sedimentation or contaminants from significantly impacting surface water.

**1.7.2.14. Cultural and Paleontological Resources:**

In November of 2013, **Archaeological Energy Consulting** conducted a Class III inventory of the proposed **MDU #9 Groundwater Monitoring Wells Project, Fremont County, Wyoming** (Report No. **050-2014-030**).

Legal Description: **T39N, R90W, Section 32**

Quad(s): **Lysite 7.5'**

Cultural resources found? No  Yes //, #'s: \_\_\_\_\_

N.R. Eligible resources found? No  Yes //, #'s: \_\_\_\_\_

N.R. Eligible resources affected? No  Yes //, #'s: \_\_\_\_\_

SHPO concurrence with above granted? Not necessary  No // Yes // SHPO Ref.  
#: \_\_\_\_\_

There is a potential for buried vertebrate fossils and/or scientifically significant non-vertebrate fossils to be present in portions of the project area. The Design Features and Stipulations described in Chapter 2.2.2.1 would provide sufficient mitigation and protection measures to prevent adverse impacts to cultural and paleontological resources.

**1.8. Remarks:**

On October 23, 2013, an onsite field examination was held for the Madden Deep Unit No. 9 Groundwater Monitoring Wells Project. The examination was attended by Andrew Gibbs and

*Chapter 1 Purpose and Need for Action:*  
*Remarks:*

Tanya Skurski (BLM). Surface Use Stipulations and Conditions of Approval (COA) are attached to the Sundry Notice as part of this approval as directed by Wyoming State IM No. 94-052 dated Feb. 7, 1994. Their combined contents will mitigate the potential impacts associated with the activities of the proposed action. As directed by WO IM No. 2004-194, should the Sundry Notice be approved, all applicable Best Management Practices (BMP) will be incorporated into the proposed action, and will be included in the BLM applied COA.

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## **Chapter 2. Description of Alternatives, Including Proposed Action:**

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## **2.1. Introduction:**

Chapter 2 describes in detail the Proposed Action and alternatives, and compares the alternatives in terms of the environmental impacts as identified in Section 1.7, Identification of Issues. The proposed action is to install/drill seven groundwater monitoring wells on BLM surface to explore, and if successful, develop oil and gas resources in a Federal Oil and Gas Lease. BLM under the MLA, must allow for the exploration and development of these resources, but would authorize use of the Federal surface and mineral resources to minimize, reduce, and avoid impacts.

Design Features, as presented in Section 2.2.2.1, have been incorporated into the Proposed Action by Burlington and were agreed upon with BLM. In addition, the Design Features may include standard operating procedures, Conditions of Approval, Stipulations, and all applicable Federal, State and local laws, regulations, Onshore Oil and Gas Orders, Instruction Memorandums, and Management Decision of the Lander RMP.

## **2.2. Description of Alternatives, Including the Proposed Action and No Action:**

### **2.2.1. Alternative A- No Action:**

The No Action alternative provides a baseline for comparison of the alternatives. This alternative describes the existing conditions and the continuing trends. If this alternative were selected, it would involve denial of the operator's Sundry Notice. The lessee would not be able to fulfill their valid lease to produce hydrocarbon products to meet the public's demand. The Madden Deep Unit No. 9 Groundwater Monitoring Wells would not be installed under the submitted Sundry Notice. The determination of hydrocarbon impacts and potential subsequent remediation would not occur. In addition, 0.1 acre of new surface disturbance on BLM surface associated with the well installations would not occur under the No Action alternative. The proposed project area would not be disturbed, requiring no reclamation of the site associated with the project.

The No Action alternative would result in existing conditions of oil and gas production in the Madden Deep Unit. The best available data (Wyoming Oil and Gas Conservation Commission, 2013) indicate that there are currently 329 wells in the Madden Deep Unit, 266 of which are active. The Madden Deep Unit also contains the Lost Cabin Gas Plant and an extensive network of roads, pipelines and power lines. The No Action Alternative would result in a continuation of the existing level and current trends of oil and gas production in the area.

### **2.2.2. Alternative B- Proposed Action:**

#### **Description of Proposed Action:**

The Operator proposes to install/drill seven groundwater monitoring wells on the Madden Deep Unit No. 9 gas well location (Map, Exhibit "A"). The depths of the wells are proposed to be 35 to 75 feet. Total new short-term (three to five years) disturbance from installation of the wells will be approximately 0.1 acre. The initial footprint for each well would be 25 feet x 25 feet. After installation and interim reclamation, the footprint for each well would be 2 feet x 2 feet. Upon completion of construction and reclamation, it is estimated that negligible surface disturbance would remain for the duration of the wells' operating lives (20+ years).

As a result of this action, there will be surface use actions as described below. Authorization of this Sundry Notice is subject to the attached Surface Use Conditions of Approval (Exhibit "B").

**Access:** The project includes use of existing access roads on federal surface. No new access roads will be required. Culverts and water bars will be installed where necessary along the route. The existing access roads will be required to support the proposed maintenance activities for the duration of the wells' operating lives (20+ years). The access roads will be surfaced as necessary with gravel or crushed rock to blend with the surrounding landscape from an approved off-site location. The roads will be maintained in good repair throughout all operations associated with the monitoring wells. The existing access roads will be maintained as crowned and ditched roads in accordance with the minimum standards of a local or resource road as established in the BLM Road Standards Manual, Section 9113; and in The Gold Book, Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, Fourth Edition, 2007. No flat blading of access roads is permitted.

All roads will be required to be maintained so as not to impede natural drainage and to prevent erosion. Erosion and sediment control structures will be installed below all fill slopes. The project will be monitored on a regular basis, and any erosion problems will be corrected immediately. Water bars will be installed along roadways where grades exceed a slope of 2%. All water bars will be constructed with the berm on the downhill side to prevent the trench from silting up. Water bar spacing will be as follows:

**Table 2.1. Access Road Water Bar Spacing**

Slope (percent)	Spacing Interval (feet)
2 or <	200
2-4	100
4-5	75
5 or >	50

Interim reclamation activities will be completed within six months of construction completion. All suitable topsoil will be conserved for use in future reclamation.

To prevent excessive loss of soil as a result of wind erosion on the project location and along the access roads, water applications or other non-saline suppressants with at least 50 percent control efficiency will be required. Dust inhibitors will be used as necessary and any erosion problems will be corrected immediately.

**Surface Facilities:** All temporary tank batteries and facilities designed to contain fluids shall be surrounded by an impervious dike designed to contain 110% of the contents of the largest vessel should a leak or spill occur. Facilities will be standard in size. All pipeline and other load lines will terminate within the bermed area. All long-term above ground production facilities shall be painted the color *Covert Green*.

**Pipelines:** The Proposed Action does not include any pipelines.

### 2.2.2.1. Design Features of the Proposed Action:

Design features are those specific means, measures or practices that make up the proposed action and alternatives. Standard operating procedures, stipulations and best management practices are considered to be design features.

*Chapter 2 Description of Alternatives, Including  
Proposed Action:  
Alternative B- Proposed Action:*

The activities, procedures, and Design Features to which Burlington has committed in agency submittals, or agreed upon based on the onsite inspection with BLM, are compiled below. These Design Features are included as part of the proposed project as COA and Stipulations in an effort to prevent adverse environmental impacts from occurring during project implementation, and minimize the type and magnitude of impacts to resources in the project area.

**Air Quality:** The operator will contact the Wyoming Department of Environmental Quality (WDEQ), Air Quality Division to determine the permit requirements prior to the installation of any oil and gas well production equipment. The Air Quality Division will provide the owner/operator with forms and guidelines for permitting and controlling air contaminant emissions from this equipment. The production of dust will be significantly reduced through accepted dust abatement techniques. Techniques include, but are not limited to, the seeding of all disturbed areas that are not utilized during the well production phase (e.g. borrow ditches and topsoil and spoil piles), and the application of water to roadways during dry periods.

**Cultural, Paleontological, and Historic Resources:** There is a potential for buried cultural and paleontological resources to be present in the project area. The Design Features and Stipulations described below would provide sufficient mitigation and protection measures to prevent adverse impacts to cultural and paleontological resources.

In November of 2013, **Archaeological Energy Consulting** conducted a Class III inventory of the proposed **MDU #9 Groundwater Monitoring Wells Project, Fremont County, Wyoming** (Report No. **050-2014-030**). There is a potential for buried cultural materials to be present in portions of the project area. There is also a potential for buried vertebrate fossils and/or scientifically significant nonvertebrate fossils to be present in portions of the project area.

Legal Description: **T39N R90W Section 32**

Quad(s): **Lysite 7.5'**

Cultural resources found? No // Yes //, #'s: \_\_\_\_\_

N.R. Eligible resources found? No / / Yes //, #'s: \_\_\_\_\_

N.R. Eligible resources affected? No // Yes //, #'s: \_\_\_\_\_

SHPO Concurrence with above granted? Not necessary // No // Yes //, SHPO Ref. #: \_\_\_\_\_

Cultural clearance recommended? No // Yes, with stipulations //

- CULTURAL AND PALEONTOLOGICAL RESOURCES STIPULATION:** Any cultural and/or paleontological resource (historic or prehistoric site or object or fossil) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures shall be made by the authorized officer after consulting with the holder.

**Wildlife:** A BLM Wildlife Biologist has determined that no proposed, threatened, and endangered species are present, and no suitable or critical habitat has been identified nor will be affected in the project area (Wildlife Clearance, Exhibit “D”). However, the BLM Wildlife Biologist determined that suitable habitat for certain BLM Wyoming Special Status Species exists in the project area. The following Special Status Species were identified: greater sage-grouse, ferruginous hawks, burrowing owls, migratory birds and sagebrush obligate bird species (i.e. sage thrasher, loggerhead shrike, Brewer’s sparrow and sage sparrow).

Protective measures for migratory birds are provided pursuant to the Migratory Bird Treaty Act (MBTA), 16 U.S.C. 703, and Bald and Golden Eagle Protection Act (BGEPA), 16 U.S.C. 668. Other fish and wildlife resources are considered under the Fish and Wildlife Coordination Act (FWCA), as amended, 16 U.S.C. 661 et seq., and the Fish and Wildlife Act of 1956, as amended, 16 U.S.C. 742a-742j.

Under the MBTA and BGEPA, the BLM has a mandatory obligation to protect the many species of migratory birds, including eagles and other raptors which may occur on lands under its jurisdiction. Measures included in the project design features that will reduce or eliminate adverse impacts to migratory birds include protective buffers, seasonal restrictions, and maintenance of habitat within the project area. Potential adverse impacts to migratory birds from the proposed action have been identified and every attempt to mitigate such impacts has been implemented. Protective measures for migratory birds and general wildlife implemented in the Design Features detailed in Chapter 2 pursuant to the MBTA, BGEPA and FWCA would provide mitigation protection in the project area for greater sage-grouse and sagebrush obligate bird species.

The greater sage-grouse, a candidate species, was determined to occur in the area, and is a BLM Special Status Species. USFWS identified it as warranted for listing under the Endangered Species Act, but it is precluded from listing due to other higher priority species. The project area does not lie within BLM Wyoming Greater Sage-Grouse Core Area.

The BLM Wildlife Biologist determined that the project area lies within suitable habitat for BLM Wyoming Sensitive Species, ferruginous hawks and burrowing owls. However, no known nests exist for these species exist in the project area. Therefore, no stipulation is being applied.

The BLM Wildlife Biologist determined that the project area lies within suitable nesting habitat for a variety of migratory birds, including some BLM Wyoming Special Status species. Surface disturbing and/or disruptive activities that have the potential to cause destruction of reproductive nests, eggs or young of migratory birds **will be prohibited during the period of May 1 to July 15**. A survey of the proposed disturbance area(s) may be conducted by the proponent to determine the presence/absence of nesting migratory birds in consideration of the area’s habitat suitability for migratory birds. If the survey locates an active nest or finds signs to indicate that an active nest is likely to be present, then surface disturbing and/or disruptive activities would be delayed until chicks have fledged. If an exception to the timing stipulation is desired, **nest surveys must be conducted no more than 7 days prior to surface disturbing and/or disruptive activities**, and be conducted by a wildlife biologist using standardized methods. If surface disturbing and/or disruptive activities cannot be initiated within 7 days after survey, an additional survey may be necessary before activities can commence during the stipulated nesting period. Nest surveys should include a 5-meter buffer around any area of surface disturbance. For activities with more than a single connected site, clearance surveys would be required for each individual disturbance area. Survey data forms and results will be provided to BLM Lander Field Office before disturbance activities are authorized. Disturbances necessary to deal with emergency

*Chapter 2 Description of Alternatives, Including  
Proposed Action:*

*Alternative B- Proposed Action:*

situations, public safety concerns or risks, or uncontrollable natural events are exempted from the Stipulation. Any exception to this requirement must have prior written approval from the Authorized Officer.

Offsite activities in the project area by operational personnel that are unrelated to the proposed project will be prohibited. All project employees will be notified of all applicable wildlife laws and penalties associated with unlawful take and harassment.

**Waste Disposal:** Garbage and other waste debris will be contained in portable wire mesh trash cages, and will be removed upon completion and disposed of at a Wyoming Department of Environmental Quality (WDEQ) approved disposal site. Self-contained portable chemical toilets will be used for human waste containment. All sewage and waste disposal will be conducted in strict accordance with applicable state and local rules and regulations.

**Facilities:** Facilities will be standard in size. All pipeline and other load lines will terminate within the bermed area. All long-term above ground production facilities shall be painted the color *Covert Green*.

**Health and Safety Practices:** To minimize undue exposure to hazardous situations, and to provide for the health and safety of workers, the operator will comply with all existing applicable rules and regulations (for example, Onshore Orders, Occupational Safety and Health Administration (OSHA) requirements, Resource Conservation and Recovery Act (RCRA), and others), that preclude the public from entering hazardous areas, and place warning signs alerting the public, as required by the BLM.

**Surface Reclamation:** The operator's Sundry Notice includes reclamation plans within the Surface Use Plan of Operations. These plans must meet the interim and final reclamation objectives of Chapter 6 of The Gold Book, Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, Fourth Edition (The Gold Book, 2007).

Planning for successful reclamation begins by selecting the most optimal location to reduce unnecessary erosion and by limiting the cut and fill of slopes. The footprint to be reclaimed is minimized by authorizing surface disturbance that is as small as possible, while still allowing for safe and efficient operations.

Once construction activities are complete, the operator is required to begin reclamation, which involves reclaiming all portions of the project area not needed for production. The portions of the construction area not needed for operational and safety purposes are to be re-contoured to a final or intermediate contour that blends with the surrounding topography as much as possible.

The disturbed areas shall be scarified, topsoil shall be re-spread evenly over areas not needed for all-weather operations, and the area seeded with a certified noxious weed free, BLM approved, seed mix of native species appropriate for the site (Exhibit "B", Surface Use Plan COA). Any topsoil and spoil piles set aside shall be re-vegetated to prevent the soil from eroding, and to help maintain its biological viability (The Gold Book, 2007).

On slopes greater than 3:1, erosion blankets or mats will be required. Weed-free straw or hay will be placed and crimped in to the soil for slopes less than or equal to 3:1. The disturbed area will be seeded with a certified noxious weed free, BLM approved, seed mix of native species appropriate for the sites (Exhibit "B", Surface Use Plan COA). Any topsoil and spoil piles set aside will be

required to follow the same methods as on the reclaimed areas to prevent the soil from eroding and to help maintain its biological viability (The Gold Book, 2007).

If during reclamation, noxious or invasive plants become established, the operator will be responsible for developing an eradication plan. This will include a comprehensive approach such as Integrated Pest Management (IPM). If chemicals are necessary, the operator will be required to obtain a Pesticide Use Proposal (PUP) with BLM authorization. To achieve final reclamation, the site must be re-contoured to the original contour or a contour that blends with the surrounding landform, stockpiled topsoil redistributed, and the site re-vegetated as stated above.

The entire location shall be fenced following seeding until rehabilitation has been completed (The Gold Book, 2007). Weeds shall be controlled on all disturbed areas within the exterior limits of the permit during the life of the project. Weed control methods shall be in accordance with guidelines established by the EPA, BLM, or appropriate authorities.

### **2.3. Alternatives Considered, But Eliminated From Further Analysis:**

An onsite field examination was held and alternative well locations were identified. However, the alternative locations would result in greater surface disturbance than the Proposed Action, or would not offer additional protection of the resources than the applied common to all Design Features would provide.

The wells have been placed in optimal geographic locations so that existing roads, pipelines, and other disturbances can be utilized to the greatest extent as possible in an attempt to reduce the need for new surface disturbance and to centralize disturbance corridors. All suitable alternatives examined at the field review have been incorporated into the Proposed Action. Therefore, the only alternatives considered further in this assessment are the Proposed Action and the No Action Alternative.

### **2.4. Summary of Impacts:**

**Table 2.2. Summary of Impacts to Affected Resources from Each Alternative**

<b>Resource</b>	<b>No Action</b>	<b>Proposed Action</b>
Climate and Air Quality	Existing Conditions and Continuing Trends	Truck, Equipment and Drilling Rig Emissions
Soils	Continued Hydrocarbon Contamination	Topsoil Removal and Soil Compaction
Vegetation	Existing Conditions and Continuing Trends	Vegetation Removal and Compaction
Wildlife Including BLM Special Status Species	Existing Conditions and Continuing Trends	Habitat Loss and Disruptive Activities
Groundwater	Continued Hydrocarbon Contamination	Sedimentation and Drawdown of Aquifer

# **Chapter 3. Affected Environment and Environmental Impacts:**

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### **3.1. Introduction:**

This section describes the current conditions, organized by resources, as identified in Section 1.7, Identification of Issues that could be affected by the Proposed Action and the No Action Alternative

#### **3.1.1. General Setting:**

The proposed project area is located in the Madden Deep Unit, approximately two miles north of Lysite, Wyoming. This area lies within the Wyoming Basin Eco-region, Rolling Sagebrush Steppe. This eco-region is a broad arid intermontane basin interrupted by hills and low mountains and dominated by grasslands and shrub lands. Primary uses in the area are mineral exploration and production, utility corridors, livestock grazing and wildlife habitat. Much of the region is used for livestock grazing, although many areas lack sufficient forage to support this activity. The region contains major natural gas and petroleum producing fields (Chapman et al, 2004).

The project will be located within mineral lease WYW-78561, and includes a proposal for the installation/drilling of seven groundwater monitoring wells. The best available data (Wyoming Oil and Gas Conservation Commission, 2013) indicate that there are currently 329 wells within the Madden Deep Unit, 266 of which are producing. The Madden Deep Unit also contains the Lost Cabin Gas Plant and an extensive network of roads, pipelines and power lines.

#### **3.1.2. Resources/Issues Brought Forward for Analysis:**

The level of resources presented are ordered and addressed in the same order presented in Chapter 1. Resources that are not impacted and are not of concern in the project area are not discussed.

#### **3.1.3. General Impact Analysis Assumptions and Guidelines:**

This section is based on the resource specialists' reports and provides the analytical basis for comparison of the alternatives. The section organizes the resources as identified in Chapter 1.0, Section 1.7 Identification of Issues, and compares the general current conditions to impacts between the Proposed Action and No Action Alternative. Design Features identified in Chapter 2.0, Section 2.2.2.1 have been incorporated into the analysis as a means to reduce or eliminate adverse impacts and will be discussed in further detail.

Impacts have been categorized according to the phase of development and duration of activities on the resources. Temporary impacts would be defined in this section as impacts that occur during construction and drilling operations (14 to 21 days). Short-term impacts would be defined as impacts to the resources that persist after construction operations have been completed, and remain until interim reclamation has been successfully achieved. Short-term impacts could last three to five years or until reclamation standards are achieved. Long-term impacts would be defined as the duration of the wells' operating lives (20+ years).

Impacts are also categorized as being direct or indirect, and beneficial or adverse. The analysis identifies these types of impacts and compares the alternatives accordingly.

Direct impacts are those impacts which are caused by the action and occur at the same time and place. Indirect impacts are those impacts which are caused by the action and are later in time

or further removed in distance, but are still reasonably foreseeable. Sometimes it is difficult to separate these impacts, and so the impacts may be described together.

### **3.1.4. Cumulative Impacts:**

Cumulative impacts refer to impacts on the environment which result from the incremental impacts of the action when added to other past, present and reasonably foreseeable future actions. The Cumulative Impacts Analysis Area (CIAA) and Cumulative Impacts Temporal Boundary (CITB) may be different for each resource and will be defined accordingly.

The best available data (Wyoming Oil and Gas Conservation Commission, 2013) indicate that there are currently 329 wells within the Madden Deep Unit, 266 of which are producing. The Madden Deep Unit also contains the Lost Cabin Gas Plant and an extensive network of roads, pipelines and power lines.

Using an average of approximately six acres of surface resource disturbance for each well project (well pad/access road/pipeline), the cumulative impacts from oil and gas development to date in the Madden Deep Unit amount to approximately 1974 acres of disturbance. The Madden Deep Unit has an area of 79,533 acres (Wyoming Oil and Gas Conservation Commission, 2013). The cumulative impacts of past and potential new oil and gas development amount to a total of approximately 1980 acres of disturbance. The level of expected development activity outside of the proposed action is not available. In 2010, 12 soil borings were installed on the MDU No. 9 location. In 2012, four soil borings were drilled on the MDU No. 9 location. This authorization would result in approximately 0.1 acre of short-term (three to five years) disturbance and negligible long-term (20+ years) disturbance to surface resources.

Petroleum and natural gas currently provide about 62% of America's energy needs (U.S. Energy Information Administration, 2012). Assuming that current market prices and demand for petroleum remains high, the BLM anticipates continued development at the current rate or more for the next one to five years. The operator and companies in nearby units have made a commitment of surface resources, and are expected to continue to drill for many years, thereby increasing cumulative impacts throughout the region. Taking into account the other roads, power lines, major pipelines, gas processing facilities, and non-energy related land use activities in the area, there are additional disturbed landscape acres of which the BLM does not have an accurate measure.

## **3.2. Climate, Climate Change and Air Quality:**

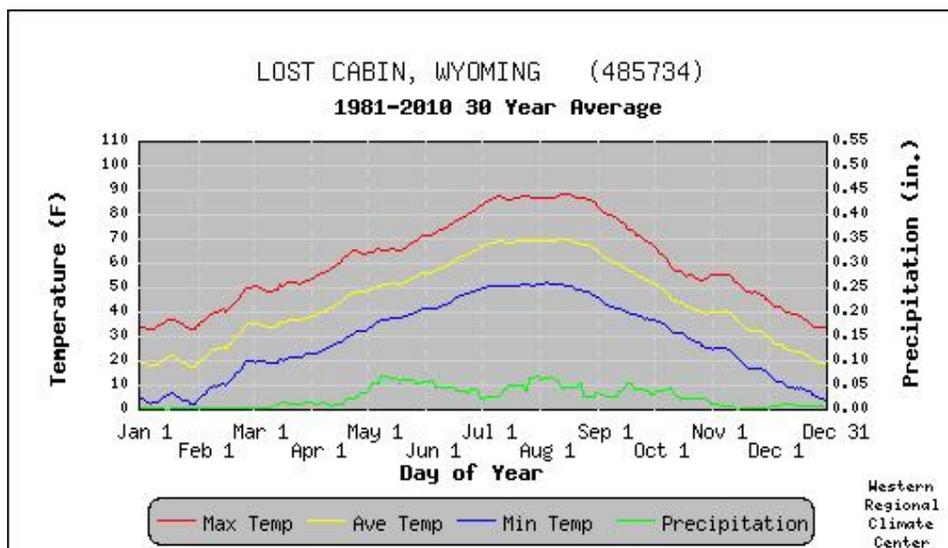
### **3.2.1. Description of Climate, Climate Change and Air Quality Resources:**

**Climate:** The project area is located in a semi-arid (dry and cold), mid-continental climate regime. The area is typified by dry, windy conditions with limited rainfall, and long, cold winters.

The nearest meteorological monitoring station is located in Lost Cabin, approximately two miles southeast of the project area. The annual average total precipitation in Lost Cabin from 1981 to 2010 was 9.42 inches. Precipitation is greatest from spring to summer, tapering off during the fall and winter months. An average of 28.2 inches of snow falls during the year, with the majority of

the snow distributed evenly between November and April (Western Regional Climate Center, 2013).

The region has cool temperatures, with average temperatures (in degrees Fahrenheit) ranging between 4.1°F and 34.6°F in January, and between 50.8°F and 86.7°F in July. The frost-free period generally occurs from May to September. Figure 3.1 shows the mean monthly temperature ranges and total precipitation amounts for Lost Cabin (Western Regional Climate Center, 2013).



**Figure 3.1. Mean Monthly Temperature Ranges and Total Precipitation Amounts**

● Max. Temp. is the average of all daily maximum temperatures recorded for the day of the year between the years 1981 and 2010.

● Ave. Temp. is the average of all daily average temperatures recorded for the day of the year between the years 1981 and 2010.

● Min. Temp. is the average of all daily minimum temperatures recorded for the day of the year between the years 1981 and 2010.

● Precipitation is the average of all daily total precipitation recorded for the day of the year between the years 1981 and 2010.

**Climate Change:** There is substantial scientific evidence that there is an increase in average global temperatures due to atmospheric concentrations of Greenhouse Gases (GHG) as well as land use changes. This warming is associated with climatic variability that exceeds the historic norm (climate change). Observed temperature increases in northern latitudes have been greater than those in other areas, and seasonal low temperatures are generally increasing faster than high temperatures. Other unevenly distributed effects of climate change include altered weather patterns, sea levels, precipitation rates, wildfire occurrences, seasonal timing, desert distribution, and plant and animal distribution. Existing climate prediction models are global in nature. Therefore, they are not at the appropriate scale to estimate potential impacts of climate change on the project area.

A growing body of evidence indicates that Earth's atmosphere is warming. Records show that surface temperatures in the Wyoming region have risen approximately 1.5 degrees Fahrenheit

since the 1960 to 1979 baseline years (Global Change Research Program, 2009b). The largest increase in average temperature has occurred in the winter months in the northern portions of the region. Relatively cold days in the region are becoming less frequent, and relatively hot days are becoming more frequent (GCRP, 2009b). Observed changes in oceans, ecosystems, and ice cover are consistent with this warming trend (National Academy of Sciences, 2006).

Concentrations of certain gases in Earth's atmosphere have been identified as being effective at trapping heat reflected off Earth's surface, thereby creating a "greenhouse effect." As concentrations of Greenhouse Gases (GHG) increase, Earth's surface warms, the composition of the atmosphere changes and global climate is affected. Concentrations of GHG have increased dramatically in Earth's atmosphere in the past century. These increases, particularly in carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), and fluorinated gases have been attributed to man-made sources and human activities (EPA, 2010a).

Climate change is likely to combine with other human-induced stress to further increase the vulnerability of ecosystems to other pests, invasive species, and loss of native species. Climate change is likely to affect breeding patterns, water and food supply, and habitat availability to some degree. Special Status Species in the planning area, such as greater sage-grouse, which are already stressed by declining habitat, increased development and other factors, could experience additional pressures as a result of climate change.

**Air Quality:** In the surrounding geographic area, the air quality is currently impacted by oil and gas operations associated with exhaust from drilling rigs, heavy trucks and heavy dirt moving equipment, as well as production of pollutants associated with production and processing of natural gas (i.e. flaring and gas plant operations). The extent to which these factors may impact air quality on any given day is dependent primarily on production activity, wind conditions, topography, and soil moisture levels. Some degree of air movement across the project area is usually evident.

The closest comprehensive wind measurements are collected at the Riverton Airport meteorological monitoring station, approximately 50 miles southwest of the project area. The average wind speed at the Riverton Airport from 1996 to 2006 was 8.6 mph and the prevailing direction was west-southwest (Western Regional Climate Center, 2013). The open rolling topography and near constant wind prevent the buildup of stagnant air in the project area, but the wind also tends to accelerate the drying of disturbed soil and contributes to the creation of dust.

### **3.2.2. Impacts on Climate, Climate Change, and Air Quality under Alternative A- No Action:**

#### **3.2.2.1. Direct and Indirect Impacts:**

The No Action Alternative would result in continuing trends of climate and air quality resource conditions.

#### **3.2.2.2. Cumulative Impacts:**

The No Action Alternative would result in continuing trends of climate and air quality resource conditions.

*Chapter 3 Affected Environment and Environmental Impacts:*

*Impacts on Climate, Climate Change, and Air Quality under Alternative A- No Action:*

### **3.2.3. Impacts on Climate, Climate Change, and Air Quality under Alternative B- Proposed Action:**

#### **3.2.3.1. Direct and Indirect Impacts:**

**Climate and Climate Change:** A variety of activities in the planning area currently generates Greenhouse Gases (GHG). Fuels combustion, industrial processes and any number of other activities on public lands result in direct emissions of GHG. Direct emissions in the planning area include those related to current and ongoing oil and gas and other minerals development, fire events, motorized vehicle use (e.g. OHV), livestock grazing, facilities development, and other fugitive emissions. Indirect GHG emissions in the planning area include the demand for electricity outside the area. If authorized by the BLM, the proposed action would result in additional GHG emissions.

In general, the largest sources of GHG emissions in the oil and gas sector are CO<sub>2</sub> emissions from natural gas compressors and drill rig engines, and fugitive CH<sub>4</sub> emissions from wellhead equipment, pneumatic devices and tanks. Emissions occur from well drilling and completion, road and well pad construction, flaring and venting, compressor operations, dehydrator and separator operations, tank venting and loadout, well head fugitives, pneumatic device operations, and vehicle traffic.

There is no reliable methodology to assess the relationship between the Proposed Action contributing to these produced levels and the overall climate change. An attempt to analyze the impacts of GHG emissions and other climate change factors from the ultimate consumption of the resources produced from the project area would be a highly speculative exercise unnecessary for the land management decisions for which the BLM is responsible. The BLM does not dictate the destination of the resource produced from federal lands. The effects from consumption are not only speculative, but beyond the scope of agency authority or control.

**Air Quality:** Temporary (14 to 21 days) impacts to air emissions would be expected from the pipeline installation construction activities. Activities would also have direct and indirect impacts to these resources depending on the type of activities.

Temporary impacts to air emissions would occur from construction operations including use of temporary generators in the project area, and would continue as long as equipment, vehicles and trucks are needed to operate, maintain and reclaim the location. These impacts to air quality would be both from fugitive dust and emissions.

Fugitive dust is basically air born particles resulting from heavy equipment and vehicle traffic being in contact with the soil surface. The effects of fugitive dust on air quality would be minimized through dust abatement practices, as discussed in the Design Features in Chapter 2.

Emissions caused by trucks and heavy equipment include the following particles:

1. particles 10 micrometers and smaller in diameter (PM<sub>10</sub>);
2. sulfur dioxide (SO<sub>2</sub>);
3. nitrogen oxides (NO<sub>x</sub>);
4. carbon monoxide (CO); and

5. volatile organic compounds (VOC).

Some temporary impacts on air quality in the immediate vicinity of the project would be caused by particulate matter and exhaust from vehicles and equipment. These impacts would be local and would likely be dispersed by prevailing winds.

### 3.2.3.2. Cumulative Impacts:

**Climate and Climate Change:** Climate change is a global phenomenon impacted by human activities and natural changes around the Earth and the surrounding atmosphere. Analysis of impacts to such a large scale process is beyond the scope of this EA. Because the project area lies within an established oil and gas field in a BLM Wyoming Designated Development Area, other BLM and non-BLM past, present and reasonably foreseeable future actions are expected to increase emissions of Greenhouse Gases in the surrounding area. The Proposed Action would add incrementally to the cumulative impacts to climate change in the CIAA. Initial impacts during the construction stages from trucks and equipment would be the most pronounced, but these would decrease rapidly after construction activities are completed.

**Air Quality:** The CIAA for air quality is the area within 10 km of the project area. The CITB for air quality in the area is the time period required for the installation of the monitoring wells (14 to 21 days). Because the project area lies within an established oil and gas field in a BLM Wyoming Designated Development Area, other BLM and non-BLM past, present, and reasonably foreseeable future actions are expected to increase emissions of pollutants in the surrounding area. The Proposed Action would add incrementally to the cumulative impacts to air quality in the CIAA. Initial impacts during the construction stage from trucks and equipment would be the most pronounced, but these would decrease rapidly after construction activities are completed.

## 3.3. Soils:

### 3.3.1. Description of Soil Resources:

The proposed project is located primarily on two soil units as defined in the Soil Survey of Fremont County, East Part of Dubois Area, Wyoming, July, 1993 Issue. The units are the Emblem-Clifsand-Rairdent complex, one to 25 percent slopes, and the Clifsand-Persayo complex, hilly, map units.

#### 3.3.1.1. Emblem-Clifsand-Rairdent Complex:

The Emblem-Clifsand-Rairdent complex, one to 25 percent slopes, map unit is composed of Emblem sandy loam, one to eight percent slopes, Clifsand very gravelly loam, two to 25 percent slopes, Rairdent loam, one to eight percent slopes. The map unit is on fan aprons and terraces. The soils are very deep and well-drained, with moderate to moderately rapid permeability. The hazard of water erosion is slight to medium, and the hazard of wind erosion is moderate to severe for these soils.

*Chapter 3 Affected Environment and Environmental  
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Soils:*

### **3.3.1.2. Clifsand-Persayo Complex:**

The Clifsand-Persayo complex, hilly, map unit is composed of Clifsand gravelly loam, two to 30 percent slopes, and Persayo loam, ten to 40 percent slopes. The map unit is on terraces, escarpments, dissected fan aprons, ridges and hills.

The Clifsand soil is very deep and well-drained, with moderately rapid permeability. The hazard of water erosion is moderate, and the hazard of wind erosion is slight for this soil.

The Persayo soil is shallow and well drained, with moderately slow permeability. The hazard of water erosion is severe, and the hazard of wind erosion is moderate for this soil.

### **3.3.2. Impacts on Soils under Alternative A- No Action:**

#### **3.3.2.1. Direct and Indirect Impacts:**

The No Action Alternative would result in continuing trends of soil resource conditions.

#### **3.3.2.2. Cumulative Impacts:**

The No Action Alternative would result in continuing trends of soil resource conditions.

### **3.3.3. Impacts on Soils under Alternative B- Proposed Action:**

#### **3.3.3.1. Direct and Indirect Impacts:**

Direct adverse impacts to soil resources result primarily from actions that remove vegetative cover, compact soil, reduce infiltration, create changes in physical and biological properties, reduce organic matter content, and increase the potential for accelerated erosion by exposing soil particles to wind and water. Disrupting natural soil horizons and removing vegetation to drill and install the monitoring wells cause a loss of soil productivity.

The direct impacts would be greatest upon the initiation of construction and disturbance associated with drilling of the groundwater monitoring wells. Additional disturbance occurs to the subsoil during construction activities and drilling of the monitoring wells. These actions could result in mixing of the topsoil and subsoil horizons and destroying the structure of the soil that is required to have a functional matrix for soil fertility and hydrologic capacity. Initially, a total of approximately 0.1 acre of soils on BLM land would be disturbed.

The Clifsand-Persayo soils are considered to have Limited Reclamation Potential (LRP). LRP areas are those defined by BLM Wyoming as having the most extreme reclamation challenges. These areas are often characterized by highly sensitive and erosive soils, highly sensitive vegetation types with severe physical or chemical limitations, steep slopes, etc. Design Features described in Section 2.2.2.1 such as water bars and erosion control devices, separately stockpiling the topsoil and spoil piles, and reseeding with a soil stabilizing native seed mix will help mitigate adverse environmental impacts to LRP soil resources.

The disturbances to soils and the removal of cover vegetation could result in accelerated rates of wind and water erosion in the Emblem-Clifsand-Rairdent soils, which are rated moderate to

severe for wind erosion, and the Persayo soil, which is rated severe for water erosion (See Section 3.3.1). Equipment traffic may create localized areas of soil compaction, decreasing infiltration rates, which could compound the effects of erosion and runoff into the watershed.

Activities occurring on overly wet or saturated soils could compound compaction and further destroy soil structure, adding to the potential impacts of reduced infiltration rates, thus reducing the likelihood of successful vegetation rehabilitation. Topsoil and subsoil materials could be mixed during construction and subsequent activities, resulting in less fertile soils and a lack of a viable seed bank. Mixed soil materials decrease the likelihood of successful re-vegetation, whether natural or reclaimed.

The potential exists for contamination of soil from fluids associated with heavy equipment, reduction in industrial hygiene and safe working environment for employees. The potential exists for chemicals to be transported, used, and temporarily stored in the project area, creating the potential for soil contamination should chemicals be used in an improper manner or in the event of an accidental spill or inappropriate release.

These impacts would be expected for the temporary during construction related activities, and until successful interim reclamation has occurred. The short-term (three to five years) disturbance to soils resulting from installation of the monitoring wells would be 0.1 acre on BLM land. Upon successful interim reclamation, negligible disturbance to soils would remain for the duration of the wells' operating lives (20+ years).

Reclamation methods and standards such as installing water bars and erosion control features separately stockpiling the topsoil and soil piles, and reseeding with a soil stabilizing native seed mix as described in Section 2.2.2.1, Design Features of the Proposed Action, would effectively reduce impacts to the soil resource. Short-term impacts are unavoidable, but improved reclamation techniques have reduced the long-term impacts to an acceptable level.

### **3.3.3.2. Cumulative Impacts:**

The CIAA for soil resources is the surrounding project area. The CITB for soil resources is the time period required for successful reseeding and reclamation of the disturbed area (three to five years). Most of the cumulative impacts to soils in oil and gas fields are a result of the need for road running surfaces, production facilities and producing well site activities. These activities have an incremental impact to the existing disturbance. Because the project area lies within an established oil and gas field in a BLM Wyoming Designated Development Area, other BLM and non-BLM past, present and reasonably foreseeable future actions would be expected to impact soils in the surrounding area. The additional increase in impacts from the Proposed Action is small considering the project adds 0.1 acre of short-term (three to five years) disturbance to the surrounding area.

### **3.4. Vegetation, Including Noxious/Invasive Plants:**

#### **3.4.1. Description of Ecological Sites and Potential Vegetation:**

##### **3.4.1.1. Emblem Ecological Site Descriptions:**

The ecological sites associated with the Emblem-Clifsand-Rairdent complex, one to 25 percent slopes, map unit include the Gravelly, five to nine-inch precipitation, Wind River Basin range site, and Loamy, five to nine-inch precipitation, Wind River Basin range site.

Potential vegetation in the Gravelly, five to nine-inch precipitation, Wind River Basin range site includes bluebunch wheatgrass, needle-and-thread, western wheatgrass, Indian ricegrass, big sagebrush and winterfat. Species such as threadleaf sedge, blue grama, big sagebrush, rubber rabbitbrush and annual forbs will increase in abundance as range conditions deteriorate. Potential production by weight (air-dry) of the desirable plant community ranges from 100 pounds per acre in unfavorable years, to 300 pounds per acre in favorable years for these soils (NRCS, 2013).

Potential vegetation in the Loamy, five to nine-inch precipitation, Wind River Basin range site includes western wheatgrass, needle-and-thread, Indian ricegrass, big sagebrush and winterfat. Species such as blue grama, Sandberg bluegrass, big sagebrush and annual forbs will increase in abundance as range conditions deteriorate. Potential production by weight (air-dry) of the desirable plant community ranges from 225 pounds per acre in unfavorable years, to 600 pounds per acre in favorable years for these soils (NRCS, 2013).

##### **3.4.1.2. Ecological Site Descriptions:**

The ecological sites associated with the Clifsand-Persayo complex, hilly map unit include the Gravelly five to nine-inch precipitation, Wind River Basin range site, and the Shallow Clayey, five to nine-inch precipitation, Wind River Basin range site.

Potential vegetation in the Gravelly, five to nine-inch precipitation, Wind River Basin range site includes bluebunch wheatgrass, needle-and-thread, western wheatgrass, Indian ricegrass, big sagebrush and winterfat. Species such as threadleaf sedge, blue grama, big sagebrush, rubber rabbitbrush and annual forbs will increase in abundance as range conditions deteriorate. Potential production by weight (air-dry) of the desirable plant community ranges from 100 pounds per acre in unfavorable years, to 300 pounds per acre in favorable years for these soils (NRCS, 2013).

Potential vegetation in the Shallow Clayey, five to nine-inch precipitation, Wind River Basin range site includes bluebunch wheatgrass, western wheatgrass, Indian ricegrass, bottlebrush squirreltail, big sagebrush, Gardner's saltbush and winterfat. Species such as blue grama, big sagebrush, birdfoot sagebrush and annual forbs will increase in abundance as range conditions deteriorate. Potential production by weight (air-dry) of the desirable plant community ranges from 125 pounds per acre in unfavorable years, to 350 pounds per acre in favorable years for these soils (NRCS, 2013).

**Noxious/Invasive Plants:** A number of invasive, non-native and noxious species occur in the geographic region surrounding the project, and may already be established in the project area itself. Species such as halogeton, Russian knapweed, and cheatgrass have the capability to dominate a site if appropriate weed abatement action is not taken. All noxious weeds being

sprayed with herbicides should be treated only by a certified applicator in accordance with Federal and State regulations and procedures.

### **3.4.2. Impacts on Vegetation under Alternative A- No Action:**

#### **3.4.2.1. Direct and Indirect Impacts:**

The No Action Alternative would result in continuing trends of vegetation resource conditions.

#### **3.4.2.2. Cumulative Impacts:**

The No Action Alternative would result in continuing trends of vegetation resource conditions.

### **3.4.3. Impacts on Vegetation under Alternative B- Proposed Action:**

#### **3.4.3.1. Direct and Indirect Impacts:**

**General Vegetation:** Direct impacts include vegetation removal, topsoil loss and compaction, disturbance of biological soil crusts, and increased fugitive dust. Surface disturbance and construction activities associated with installation of the pipeline will account for 0.1 acre of short-term (three to five years) disturbance to BLM lands. After successful interim reclamation, which may require three to five years for vegetation to re-establish, no long-term disturbance resulting from this project would remain for the duration of the wells' operating lives (20+ years).

Remaining vegetation will re-grow and disturbed areas will be reclaimed to BLM standards as described in the project design features identified in the COA. Wyoming standard mitigation guidelines, lease stipulations, decisions in the Lander RMP associated with air quality, soils, surface, and groundwater; and vegetation involving interim reclamation and dust abatement, could effectively minimize the impacts to vegetation.

Reclamation of surface disturbance will occur following the construction of the pipeline corridor. Areas not needed for production operations will be re-contoured and scarified to break up any soil compaction. Afterwards, topsoil will be replaced and seeded with a seed mixture agreed to by the operator and the BLM. All seed will be weed-free and tested in accordance with applicable state law to eliminate the potential for introduction of weeds. The seed drilling method will be implemented with the contour of any slopes to reduce the risk of erosion. To provide further soil stabilization, any remaining topsoil and spoil material not used for interim reclamation should be seeded using a hydro-seed and/or hydro-mulch method. The operator will also fence the disturbed areas until successful rehabilitation has occurred to prevent additional surface disturbance. Prior to final reclamation, the operator will contact the BLM for a final approved seed mixture for the site.

Under the proposed project, there will be no direct disturbance to existing wetland ecological sites. Construction, operation, abandonment, and reclamation actions will avoid these isolated wetlands ecological sites. Potential surface runoff and sedimentation, topsoil loss and compaction, and disturbance of biological soil crusts from disturbed ecological sites will be minimized through the implementation of appropriate erosion control measures found in the project Design Features. Increased vehicle traffic on existing access routes, especially during dry periods, will

be the primary source of fugitive dust settling on roadside vegetation. Project design features to minimize fugitive dust in the project area will be implemented.

**Noxious/Invasive Plants:** The Proposed Action would increase the likelihood of noxious and invasive weeds being introduced to the project area. The disturbance associated with construction of the fiber optic and water line corridor provides a mode for transportation and an opportunity for weed establishment. These species are likely to become established within the project area, especially in disturbed soils or newly reclaimed areas. Potential sources of weed seed include vehicles traveling to and from the well site, dormant seeds on site, straw used for mulching, and commercial seeds for reclamation that may not be totally weed-free. Weed seed is also spread by birds, wind and water, and can become attached to the fur of grazing herbivores and transported as animals move.

A number of invasive, non-native and noxious species occur in the geographic region surrounding the project, and may already be established in the project area itself. Reclamation efforts may take several years to establish native plant species. With a lack of competition from native perennials, there is expected to be an increase in early seral stage plant species such as halogeton, ensuring a seed source for invasive species to become established with each new disturbance. These early seral stage plants offer little in the way of palatability to livestock or wildlife, and without proper weed abatement action, can dominate the site of disturbance and spread to the surrounding rangelands.

Direct impacts include damage to or loss of individual plants, loss of habitat or habitat quality, loss of pollinators and loss of seed banks. Direct plant mortality, habitat loss, and the spread of Invasive Non-Native Species (INNS) can result from surface disturbance associated with oil and gas development activities. Indirect impacts include the loss of suitable habitat for future colonization. Surface disturbing activities can also indirectly impact sensitive plant species by contributing to soil erosion and transporting INNS into sensitive plant habitat.

### **3.4.3.2. Cumulative Impacts:**

The CIAA for vegetation is the surrounding project area. The CITB for vegetation resources is the time period required for successful reclamation to occur (three to five years). The Proposed Action would add incrementally to adverse cumulative impacts on vegetation. Because the project area lies within an established oil and gas field in a BLM Wyoming Designated Development Area, other BLM and non-BLM past, present and reasonably foreseeable future actions are expected to impact vegetation resources in the surrounding area. These actions include disturbances associated with well pads, access roads and pipelines. Most of the cumulative impacts to vegetation are a result of the need for vegetation removal and construction related activities, which compact the soils, making water infiltration low and plant establishment unlikely.

It should also be realized that due to the low precipitation and soil types in this area, reclamation of disturbed areas to a pre-disturbance state may take more than ten years (in the case of big sagebrush and other woody species). Areas that will be reclaimed after construction activities have been completed will most likely be dominated by halogeton and other early seral stage species. These species are capable of stabilizing the soil against wind erosion and small precipitation events. However, these species lack the root mass and depth to protect soils against heavy precipitation events, and thus these sites are open to blowouts in the event of heavy rain and strong gusting wind.

### **3.5. Wildlife, Including BLM Wyoming Special Status Species:**

#### **3.5.1. Description of Wildlife Resources:**

##### **3.5.1.1. General Wildlife:**

The project area is located in the Rolling Sagebrush Steppe of the Wyoming Basin Eco-region (Chapman et al., 2004). As such, it is typically inhabited primarily by small mammals such as ground squirrels, prairie dogs, and various other rodents, rabbits, and burrowing species. In addition, it may also include various small bird species. These lesser species are, in turn, preyed upon by larger carnivores such as fox, coyote, badger, and skunk and by raptor species such as golden eagles and various hawks. In addition, the project area may also be used by larger species such as pronghorn antelope and mule deer (Wildlife Clearance, Exhibit "D").

##### **3.5.1.2. BLM Wyoming Special Status Species:**

**Greater Sage-Grouse:** The proposed project does not lie within BLM Wyoming Designated Greater Sage-Grouse Core Area. However, the project area does contain suitable habitat for greater sage-grouse. It is the policy of Wyoming BLM (Instruction Memorandum No. WY-2012-019) to manage greater sage-grouse seasonal habitats and maintain habitat connectivity to support population objectives set by the Wyoming Game and Fish Department.

Greater sage-grouse populations have been declining across the western United States, prompting several petitions to list them as threatened under the Endangered Species Act (ESA). In March of 2010, the U.S. Fish and Wildlife Service (USFWS) determined that the greater sage-grouse warranted listing as a threatened species under the ESA, but precluded listing due to higher priority actions. Threats to greater sage-grouse include degradation, loss, and fragmentation of habitat, predation, West Nile Virus, and human disturbance during sensitive periods. Energy exploration and development within the Madden Deep Unit impact greater sage-grouse habitat as a result of roads, well pads and construction related activities. The net result is that greater sage-grouse habitat is fragmented by wells, facilities, roads, pipelines, and utilities associated with these new and existing developments.

Management will focus on maintaining sagebrush and understory diversity in habitat for greater sage-grouse and other sagebrush obligate species unless vegetative treatments are needed to achieve habitat objectives. Because greater sage-grouse is one of the largest and most visible Special Status bird species, it is typically used as an indicator species for other sagebrush obligate birds and small mammals. Therefore, management actions that protect greater sage-grouse habitat will generally have beneficial impacts on all sagebrush obligate species.

**Migratory Birds and Sagebrush Obligates:** The BLM Wildlife Biologist has determined that the project area lies within suitable habitat for migratory birds and BLM Wyoming Special Status sagebrush obligate bird species, sage sparrow, Brewer's sparrow, sage thrasher and loggerhead shrike. These species occupy sagebrush, basin-prairie shrub lands and mountain foothill shrub lands.

### **3.5.2. Impacts on Wildlife Species under Alternative A- No Action:**

#### **3.5.2.1. Direct and Indirect Impacts:**

The No Action Alternative would result in continuing trends of wildlife resource conditions.

#### **3.5.2.2. Cumulative Impacts:**

The No Action Alternative would result in continuing trends of wildlife resource conditions.

### **3.5.3. Impacts on Wildlife Species under Alternative B- Proposed Action:**

#### **3.5.3.1. Direct and Indirect Impacts:**

##### **General Wildlife:**

Impacts to wildlife species are generally described as the loss, degradation or fragmentation of habitat or key habitat features; the disturbance/disruption of wildlife during sensitive time periods; or direct animal mortality. Adverse impacts from mineral exploration and development include the displacement of wildlife in developed areas, wildlife avoidance of areas around development from noise and human presence, the reduction in usable habitat, and the disruption of migration corridors that link seasonal ranges. Increases in vehicular traffic are expected to have temporary (approximately 14 to 21 days) impact on wildlife. To minimize the impacts of habitat loss for some species, all areas will be reclaimed to BLM standards. Reclamation will be required according to the Design Features described in Chapter 2.

The principal short-term direct impacts to wildlife likely to be associated with the proposed project would include the loss of certain wildlife habitats due to the development of construction operations, habitat fragmentation, displacement of some wildlife species, and an increase in the potential for collisions between wildlife and motor vehicles. Project-related surface disturbance, facilities, and human activity would reduce available habitat both by loss and fragmentation. Temporary or construction-phase (14 to 21 days) surface disturbance on BLM lands associated with the proposed project will be approximately 0.1 acre. Direct impacts to wildlife would potentially include the loss of potential nesting, wintering, and foraging habitats. If construction were to occur during the spring/summer months, the proposed project could result in reproductive failure (nest/burrow abandonment, and mortality of eggs or young).

Long-term impacts would occur from habitat fragmentation associated with roads, utility corridors, construction, and long-term avoidance of development sites and facility locations. Potential impacts to wildlife include disturbance of localized areas, loss of habitat, long-term degradation of habitat, and direct mortality of small mammals or nesting birds. Surface disturbance that results in the loss of sagebrush habitat would have a long-term adverse impact because of the difficulty of establishing shrubs in reclamation areas due to the time it takes plants to establish and grow. Due to prolonged reclamation time, oil and gas development in low precipitation areas can result in long-term impacts from habitat loss and fragmentation.

##### **BLM Wyoming Special Status Species:**

**Greater Sage-Grouse:** Direct impacts to greater sage-grouse result from the direct loss of important sagebrush habitat or a key habitat feature such as a nest site or lek area, or from animal mortality. Surface disturbance that results in the loss of sagebrush habitat will have a long-term adverse impact because of the difficulty of establishing shrubs in reclamation areas due to the time it takes plants to establish and grow. Greater sage-grouse can also be directly disturbed by human activities, potentially causing them to abandon a nest, lek or home range. Disturbance during sensitive periods (e.g. winter and breeding) leads to lower recruitment rates and higher mortalities, resulting in adverse impacts to the species. Direct impacts to greater sage-grouse could also include mortality from vehicles, fence entanglements or drowning.

Indirect impacts to greater sage-grouse occur by changing habitat characteristics or quality, which can ultimately result in changes in migrations patterns, habitat use, carrying capacity, and long-term population viability. Indirect impacts to greater sage-grouse can also occur when specific actions change the habitat in a way that makes it unsuitable for future habitation. Disturbance impacts can range from short-term displacement and shifts in activities to long-term abandonment of home range.

**Migratory Birds and Sagebrush Obligates:** Direct impacts to migratory birds and sagebrush obligate bird species result from the direct loss of important habitat or a key habitat feature such as a nest site or from animal mortality. These species can also be directly impacted by human activities, potentially causing them to abandon a nest or home range.

Indirect impacts to migratory birds and sagebrush obligate bird species occur by changing habitat characteristics or quality, which can ultimately result in changes in migrations patterns, habitat use, carrying capacity, and long-term population viability. Disturbance impacts can range from short-term displacement and shifts in activities to long-term abandonment of home range.

### 3.5.3.2. Cumulative Impacts:

**Greater Sage-Grouse:** The CIAA for greater sage-grouse is the project area plus a four-mile buffer. The CITB for greater sage-grouse is the time period required for successful reclamation to occur (three to five years). Proposed and potential development activities within the greater sage-grouse CIAA include oil and gas development and livestock grazing. Project related activities have the potential to remove sagebrush, which could result in the loss of habitat and displacement of prey. Because the project area lies within an existing oil and gas field in a BLM Wyoming Designated Development Area, other BLM and non-BLM past, present and reasonably foreseeable future actions are expected to impact greater sage-grouse in the surrounding area. These actions include disturbances associated with well pads, access roads and pipelines.

**Migratory Birds and Sagebrush Obligates:** The CIAA for migratory birds and sagebrush obligate bird species is the project area plus a one-quarter-mile buffer. The CITB for migratory birds and sagebrush obligate bird species is the time period required for successful reclamation to occur (three to five years). Project related activities have the potential to remove sagebrush, which could result in the loss of habitat and displacement of prey. Because the project area lies within an existing oil and gas field in a BLM Wyoming Designated Development Area, other BLM and non-BLM past, present and reasonably foreseeable future actions are expected to impact migratory birds and sagebrush obligates in the surrounding area. These actions include disturbances associated with well pads, access roads and pipelines.

*Chapter 3 Affected Environment and Environmental  
Impacts:  
Impacts on Wildlife Species under Alternative B-  
Proposed Action:*

## **3.6. Groundwater:**

### **3.6.1. Description of Groundwater Resources:**

Groundwater in the Wind River Basin is generally found in aquifers, although it is also present in unconfined alluvial sediments and in isolated, saturated outcrops. Formations capable of producing the largest quantity of water include: Quaternary alluvium; Tertiary deposits in the Wind River, Battle Spring, Wasatch, and Fort Union Formations; Cretaceous formations, including the Mesaverde Group, Frontier, and Cloverly Formations; the Sundance-Nugget Sandstone of Jurassic age; and the Tensleep and Madison Formations of Paleozoic age.

There has been relatively little development of groundwater resources in the project area. Therefore, little information exists on well yield, aquifer properties, water quality, recharge and discharge relationships, or basin yield. The depth to groundwater at the proposed project area is approximately 30 to 50 feet (Wyoming State Engineer's Office, 2013).

### **3.6.2. Impacts on Groundwater under Alternative A- No Action:**

#### **3.6.2.1. Direct and Indirect Impacts:**

The No Action Alternative would result in continuing trends of groundwater resource conditions.

#### **3.6.2.2. Cumulative Impacts:**

The No Action Alternative would result in continuing trends of groundwater resource conditions.

### **3.6.3. Impacts on Groundwater under Alternative B- Proposed Action:**

#### **3.6.3.1. Direct and Indirect Impacts:**

One of the primary BLM management actions that impact water quantity is minerals development. Direct impacts to groundwater quality and quantity result from changes in the number of wells drilled in a given area, including domestic or municipal water supply wells, oil and gas wells, and water disposal or injection wells. Indirect impacts to groundwater quality and quantity result from activities that modify recharge areas related to groundwater systems. For example, activities that decrease vegetative cover or increase runoff can reduce infiltration of precipitation, thereby reducing recharge to groundwater aquifers. Produced water from oil and gas wells has the greatest potential to impact groundwater quality and quantity where the wells are in areas with shallow depth to groundwater.

The regional static depth to groundwater is approximately 30 to 50 feet in this area (Wyoming State Engineer's Office, 2013). Given the depth to groundwater, there is potential for contamination of groundwater resources during drilling operations.

Drilling will penetrate fresh water in the surface sediments. There will be a potential to contaminate aquifers due to equipment failures, or if standard operating procedures are not

followed. Casings may develop leaks or, if not plugged properly, contaminants could move and commingle with other aquifers or groundwater.

To lesson any potential impacts, the BLM will review the proposed drilling programs submitted by the operator to ensure that casing and cementing designs meet or exceed standard safety factors. Any sub-surface water will be protected with special casing and cementing designs, and operations will be monitored and inspected during the drilling process and throughout the lives of the wells. Any additional activities such as re-completions or plugging are similarly designed and reviewed to protect groundwater resources.

### **3.6.3.2. Cumulative Impacts:**

The Proposed Action may result in additional cumulative impacts to groundwater resources in the project area. The CIAA for impacts to groundwater is the area within a 5 kilometer radius of the project area. The cumulative impacts analysis temporal boundary for impacts to groundwater is the duration of the wells' operating lives (20+ years). The seven monitoring wells are being drilled to proposed depths of 35 to 75 feet. The regional static depth to groundwater is approximately 30 to 50 feet in this area (Wyoming State Engineer's Office, 2013). Given the depth to groundwater, there is potential for contamination of groundwater resources during drilling operations. Because the project area lies within an established oil and gas field in a BLM Wyoming Designated Development Area, other BLM and non-BLM past, present and reasonably foreseeable future actions would be expected to impact groundwater resources in the surrounding area.

## **3.7. Unavoidable Adverse Impacts (All Resources):**

NEPA section 102(c) mandates disclosure of "any adverse environmental effects which cannot be avoided should the proposal be implemented." These are impacts for which there are no mitigation measures or impacts that remain even after the implementation of mitigation measures. Implementation of the Proposed Action would result in unavoidable adverse impacts to some resources.

The CEQ 40 CFR 1500.2(e) defines unavoidable adverse impacts to be impacts that cannot be avoided due to constraints in alternatives. These impacts do not have to be avoided by the planning agency, but they must be disclosed, discussed, and mitigated, if possible.

In general, development and surface disturbing activities, including those from mineral extraction and energy development, would result in unavoidable adverse impacts, including soil compaction and erosion, loss of vegetative cover, spread of INNS, disturbance to and displacement of wildlife, and visual intrusions on the landscape. Conversely, proposed restrictions on some activities, such as OHV use, energy development and livestock grazing, intended to protect sensitive resources and resource values would result in unavoidable adverse impacts to some users, operators and permittees by limiting their ability to use public lands and potentially increasing their operating costs.

Under NEPA, an agency does not have to avoid adverse impacts, but is required to identify and disclose such impacts. The impacts of the Proposed Action are not considered substantial so an Environmental Impact Statement is not required.

*Chapter 3 Affected Environment and Environmental  
Impacts:  
Unavoidable Adverse Impacts (All Resources):*

### **3.7.1. Unavoidable Adverse Impacts Under Alternative A- No Action:**

- Continued presence of contaminated soils and groundwater
- Failure to identify hydrocarbon impacts to soils and groundwater
- Failure to initiate cleanup operations for the Madden Deep Unit No. 9 gas well location

### **3.7.2. Unavoidable Adverse Impacts Under Alternative B- Proposed Action:**

- Short-term (three to five years) 25 feet x 25 feet surface disturbance for each well
- Soil compaction and vegetation trampling by truck mounted drill rig
- Temporary (14 to 21 days) groundwater drawdown and aquifer sedimentation during drilling operations

## **3.8. Relationship of Short-Term Uses and Long-Term Productivity (All Resources):**

The CEQ establishes (40 CFR 1502.16) that the balance or trade-off between short-term uses and long-term productivity needs to be defined in relation to the activity in question. The decision maker and members of the public need to have a clear sense of what they are gaining or losing in the short term and long term. For the purpose of this analysis, the short-term is considered three to five years, whereas the long-term is 20+ years.

### **3.8.1. Relationship of Short-Term Uses and Long-Term Productivity Under Alternative A- No Action:**

The short-term benefit of avoiding disturbance to soils and vegetation would be offset by continued hydrocarbon impacts to soils and groundwater.

### **3.8.2. Relationship of Short-Term Uses and Long-Term Productivity Under Alternative B- Proposed Action:**

The short-term impacts of soil compaction and vegetation trampling would be offset by identification of hydrocarbon impacts and potential cleanup of the soils and groundwater.

## **3.9. Irreversible and Irretrievable Commitments of Resources (All):**

NEPA Section 102(2c) and section 1502.16 of the CEQ NEPA implementing regulations require that the discussion of environmental consequences include a description of, “any irreversible or

irretrievable commitment of resources which would be involved in the proposal should it be implemented.”

Irreversible commitments are those that cannot be reversed, except perhaps in the extreme long term. Examples of irreversible impacts would be species extinction, ore extraction, and logging of an old growth forest.

Irretrievable commitments are those that are lost for a long period of time. Extraction of oil, gas, sand or gravel would constitute irreversible impacts because these salable minerals cannot be renewed in the ground within a reasonable time frame.

Impacts from some actions can be both irretrievable and irreversible for some resources. Management actions most likely to result in irreversible and/or irretrievable impacts include those related to development and surface disturbance such as mineral extraction and energy development

### **3.9.1. Irreversible and Irretrievable Commitments of Resources Under Alternative A- No Action:**

**Table 3.1. Irreversible and Irretrievable Commitments of Resources Under Alternative A- No Action**

Affected Resource	Irreversible Commitment	Irretrievable Commitment
Soils	No	Yes
Vegetation	No	No
Air Quality	No	No
Groundwater	No	Yes
Wildlife	No	No

### **3.9.2. Irreversible and Irretrievable Commitments of Resources Under Alternative B- Proposed Action:**

**Table 3.2. Irreversible and Irretrievable Commitments of Resources Under Alternative B- Proposed Action**

Affected Resource	Irreversible Commitment	Irretrievable Commitment
Soils	No	No
Vegetation	No	No
Air Quality	No	No
Groundwater	No	No
Wildlife	No	No

# **Chapter 4. Consultation and Coordination:**

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## 4.1. Persons, Groups, and Agencies Consulted:

**Table 4.1. List of Preparers**

Name	Title	Responsible for the Following Section(s) of this Document
Andrew Gibbs	Natural Resource Specialist	Author
Tim Vosburgh	Wildlife Biologist	Wildlife
Craig Bromley	Archeologist	Cultural and Paleontological

## 4.2. Summary of Public Participation:

There was no scoping or public involvement process applied to this action apart from posting the Environmental Assessment on BLM's NEPA Register.