

**DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
FARMINGTON FIELD OFFICE**

Project: October 2012 Competitive Oil and Gas Lease Sale

EA Log Number: DOI-BLM- NM- F010- 2012- 164 -EA

Location: Locations in Sandoval County & Rio Arriba County, New Mexico.

Finding of No Significant Impact

Based on the analysis of potential environmental impacts contained in the attached Environmental Assessment (EA), I have determined the Preferred Alternative (Alternative C) is not expected to have significant impacts on the environment. The impacts of leasing the fluid mineral estate in the areas described with this EA have been previously analyzed in the 2003 Farmington RMP and the 2002 Biological Assessment; and the lease stipulations that accompany the tracts proposed for leasing would mitigate the impacts of future development on these tracts. Therefore, preparation of an Environmental Impact Statement is not warranted.

Prepared by:

_____ Date _____
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Reviewed by:

_____ Date _____
Gary Torres, Farmington Field Office Manager

Approved by:

_____ Date _____
Jesse Juen, New Mexico State Director

**BUREAU OF LAND MANAGEMENT
FARMINGTON FIELD OFFICE**

**ENVIRONMENTAL ASSESSMENT FOR
October 2012 COMPETITIVE OIL AND GAS LEASE SALE
DOI-BLM- NM- F010- 2012- 164 -EA**

INTRODUCTION

It is the policy of the Bureau of Land Management (BLM) as derived from various laws, including the Mineral Leasing Act of 1920 (MLA), as amended [30 U.S.C. 181 *et seq.*], and the Federal Land Policy and Management Act of 1976 (FLPMA), as amended, to make mineral resources available for disposal and to manage for multiple resources which include the development of mineral resources to meet national, regional, and local needs.

The BLM New Mexico State Office (NMSO) conducts a quarterly competitive lease sale to offer available oil and gas lease parcel(s) in New Mexico, Oklahoma, Texas, and Kansas. A Notice of Competitive Lease Sale (NCLS), which lists lease parcel(s) to be offered at the auction, is published by the NMSO at least 90 days before the auction is held. Lease stipulations applicable to each parcel(s) are specified in the Sale Notice. The decision as to which public lands and minerals are open for leasing and what leasing stipulations are necessary, based on information available at the time, is made during the land use planning process. Surface management of non-BLM administered land overlaying federal minerals is determined by the BLM in consultation with the appropriate surface management agency or the private surface owner.

In the process of preparing a lease sale the NMSO sends a draft parcel list to any Field Offices in which parcel(s) are located. Field office staff then review the legal descriptions of the parcel(s) to determine if they are in areas open to leasing; if new information has become available which might change any analysis conducted during the planning process; if appropriate consultations have been conducted; what appropriate stipulations should be included; and if there are special resource conditions of which potential bidders should be made aware. The parcels nominated for this sale, along with the appropriate stipulations from the 2003 Farmington Resource Management Plan (RMP) and subsequent amendments, are posted online for a two week public scoping period. Comments received are reviewed and incorporated into the Environmental Assessment (EA).

Once the draft parcel review is completed and returned to the NMSO, a list of nominated lease parcel(s) with specific, applicable stipulations is made available online to the public through the NCLS. On rare occasions, additional information obtained after the publication of the NCLS may result in deferral of certain parcel(s) prior to the lease sale.

This EA documents the Farmington Field Office (FFO) review of nineteen (19) parcels nominated for the October 2012 Competitive Oil and Gas Lease Sale that are under the administration of the FFO. It serves to verify conformance with the approved land use plan, provides the rationale for deferring or dropping parcel(s) from a lease sale, as well as providing rationale for attaching additional lease stipulations to specific parcel(s).

The parcels and applicable stipulations were posted online for a two week public scoping period starting on April 23, 2012. Scoping comments were received from a private landowner. In addition, this EA will be made available for public review and comment for 30 days beginning May 30, 2012. Any comments provided prior to the lease sale will be considered and incorporated into the EA as appropriate.

1.0 Purpose and Need

The purpose is to consider opportunities for private individuals or companies to explore for and develop oil and gas resources on public lands through a competitive leasing process.

The need of the action is established by the BLM's responsibility under the MLA, as amended, to promote the mining of oil and gas on the public domain. The MLA also establishes that deposits of oil and gas owned by the United States are subject to disposition in the form and manner provided by the MLA under the rules and regulations prescribed by the Secretary of the Interior, where consistent with the FLPMA, the National Environmental Policy Act (NEPA) of 1969, as amended (Public Law 91-90, 42 USC 4321 iet seq.), and other applicable laws, regulations, and policies.

The BLM will decide whether or not to lease the nominated parcel(s) and, if so, under what terms and conditions.

1.1 Conformance with Applicable Land Use Plan and Other Environmental Assessments

The applicable land use plan for this action is the 2003 Farmington RMP. The RMP designated approximately 2.59 million acres of federal minerals open for continued oil and gas development and leasing under Standard Terms and Conditions. The RMP, along with the 2002 Biological Assessment, also describe specific stipulations that would be attached to new leases offered in certain areas. Therefore, it is determined that the alternatives considered conform to fluid mineral leasing decisions in the 2003 Farmington RMP and are consistent with the goals and objectives for natural and cultural resources.

Pursuant to 40 Code of Federal Regulations (CFR) 1508.28 and 1502.21, this EA is tiered to and incorporates by reference the information and analysis contained in the 2003 Farmington RMP its Final Environmental Impact Statement. While it is unknown precisely when, where, or to what extent well sites or roads would be proposed, the analysis of projected surface disturbance impacts, should a lease be developed, is based on potential well densities listed in the Reasonable Foreseeable Development (RFD) Scenario included in the 2003 Farmington RMP and the 2002 Biological Assessment. While an appropriate level of site-specific analysis of individual wells or roads would occur when a lease holder submits an Application for Permit to Drill (APD), assumptions based on the RFD scenario may be used in the analysis of impacts in this EA.

FLPMA established guidelines to provide for the management, protection, development, and enhancement of public lands (Public Law 94-579). Section 103(e) of FLPMA defines public

lands as any lands and interest in lands owned by the U.S. For split-estate lands where the mineral estate is an interest owned by the U.S., the BLM has no authority over use of the surface by the surface owner; however, the BLM is required to declare how the federal mineral estate will be managed in the RMP, including identification of all appropriate lease stipulations (43 CFR 3101.1 and 43 CFR 1601.0-7(b); BLM Manual Handbook 1601.09 and 1624-1).

1.2 Federal, State or Local Permits, Licenses or Other Consultation Requirements

Purchasers of oil and gas leases are required to comply with all applicable federal, state, and local laws and regulations, including obtaining all necessary permits required should lease development occur.

Farmington Field Office biologists reviewed the proposed action and determined it would be in compliance with threatened and endangered species management guidelines outlined in Biological Opinions Cons. #2-22-01-I-389. No further consultation with the U.S. Fish and Wildlife Service (USFWS) is required at this stage.

Federal regulations and policies require the BLM to make its public land and resources available on the basis of the principle of multiple-use. At the same time, it is BLM policy to conserve special status species and their habitats, and to ensure that actions authorized by the BLM do not contribute to the need for the species to become listed as threatened or endangered by the USFWS.

Compliance with Section 106 responsibilities of the National Historic Preservation Act (NHPA) are adhered to by following the Protocol Agreement between New Mexico BLM and New Mexico State Historic Preservation Officer (Protocol Agreement), which is authorized by the National Programmatic Agreement between BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers, and other applicable BLM handbooks. When draft parcel locations are received by the FFO, cultural resource staff reviews the locations to determine if any are within known areas of concern.

Native American consultation is conducted by certified mail regarding each lease sale activity. If Traditional Cultural Properties (TCP) or heritage-related issues are identified, such parcel(s) are withheld from the sale while letters requesting information, comments, or concerns are sent to the Native American representative. If the same draft parcel(s) appear in a future sale, a second request for information is sent to the same recipients and the parcel(s) will be held back again. If no response to the second letter is received, the parcel(s) are allowed to be offered in the next sale (third sale).

If responses are received, BLM cultural resources staff will discuss the information or issues of concern with the Native American representative to determine if all or portions of a parcel need to be withdrawn from the sale, or if stipulations need to be attached as lease stipulations. If the nominated parcels are private surface owners, no Tribal Consultation was necessary.

In Section 1835 of the Energy Policy Act of 2005 (43 U.S.C. 15801), Congress directed the Secretary of the Interior to review current policies and practices with respect to management of

federal subsurface oil and gas development activities and their effects on the privately owned surface. The Split Estate Report, submitted in December 2006, documents the findings from consultation on the split estate issue with affected private surface owners, the oil and gas industry, and other interested parties.

In 2007, the Legislature of the State of New Mexico passed the Surface Owners Protection Act. This Act requires operators to provide the surface owner at least five business days' notice prior to initial entry upon the land for activities that do not disturb the surface; and provide at least 30 days' notice prior to conducting actual oil and gas operations. At the New Mexico Federal Competitive Oil and Gas Lease Sale conducted on October 17, 2007, the BLM announced the implementation of this policy. Included in this policy is the implementation of a Notice to Lessees (NTL), a requirement of lessees and operators of onshore federal oil and gas leases within the State of New Mexico to provide the BLM with the names and addresses of the surface owners of those lands where the Federal Government is not the surface owner, not including lands where another federal agency manages the surface.

The BLM NMSO office would then contact the surface owners and notify them of the expression of interest and the date the oil and gas rights would be offered for competitive bidding. The BLM would provide the surface owners with its website address so they may obtain additional information related to the oil and gas leasing process, the imposition of any stipulations on that lease parcel(s), federal and state regulations, and best management practices (BMPs). The surface owners may elect to protest the leasing of the minerals underlying their surface.

If the BLM receives a protest, the parcel(s) would remain on the lease sale; however, the BLM would resolve any protest prior to issuing an oil and gas lease for that parcel(s). If the protest is upheld, the BLM would return the payments received from the successful bidder for that parcel(s). After the lease sale has occurred, the BLM would post the results on its website and the surface owner may access the website to learn the results of the lease sale.

1.3 Identification of Issues

An internal review of the Proposed Action was conducted by an interdisciplinary team (ID Team) of the FFO resource specialists in April 2012 to identify and consider potentially affected resources and associated issues. Both USFWS and Forest Service representatives were a part of the ID Team meeting. During the meeting, the ID Team developed the Proposed Action Alternative, presented in section 2.2 below.

The parcels included in the Proposed Action, along with the appropriate stipulations from the RMP, were posted online at:

http://www.blm.gov/nm/st/en/prog/energy/oil_and_gas/oil_and_gas_lease.html for a two week public scoping period beginning April 23 through March 7, 2012. Scoping comments were received from two private landowners.

The private surface owner of property that is located just south of Parcel 29, specifically Lots 2 and 4 of Section 8, T22N, R1W, commented that the oil and gas development may have an adverse impact on the gardens and orchard they have on the south end of this property, as well as on the elk herds that graze this area, especially at the north end.

The private surface owner of Parcel 35 has objected to the leasing of this parcel due to a non-profit Residence Summer Camp, Retreat and Conference Center located on their property and potential impacts to Native American artifacts and endangered species. Based on a field visit, the camp was found to be located approximately 4-5 miles north of the parcel boundary. The mineral estate is owned by the federal government and as such, obligations exist that require the BLM to lease the tract for mineral extraction. The mineral estate underlying the private surface was identified as open to leasing under standard terms and conditions in the 2003 Farmington RMP. Native American artifacts and endangered species habitat have been identified as an issue and will be analyzed in this EA.

Based on these efforts the following issues have been determined relevant to the analysis of this action:

- *What effects will the proposed action have on the wildlife?*
- *What effects will the proposed action have on the vegetation?*
- *What effects will the proposed action have on fee surface owners?*
- *What effects will the proposed action have on surrounding homes and properties?*
- *What effects will the proposed action have on Air Quality and Climate?*
- *What effects will the proposed action have on visual resources?*

Several issues were considered during project scoping but dismissed from detailed analysis because there would be no potentially significant effects related to the issues resulting from any of the alternatives presented below. The following resources were determined by an ID Team of resource specialists, following their onsite visit and review of the RMP and other data sources to not be present were: Areas of Critical Environmental Concern, Prime or Unique Farmland, Floodplains, Wild and Scenic Rivers, Wetlands/Riparian Zones, and Wild Horses and Burros.

PROPOSED ACTIONS AND ALTERNATIVES

2.0 Alternatives Including the Proposed Action

2.1 Alternative A - No Action

The BLM NEPA Handbook (H-1790-1) states that for EAs on externally initiated proposed actions, the no action alternative generally means that the preferred action would not take place. In the case of a lease sale, this would mean that an expression of interest to lease (parcel nomination) would be denied or rejected, and the nineteen (19) parcels would not be offered for lease during the October 2012 Competitive Oil and Gas Lease Sale. Surface management and any ongoing oil and gas development on surrounding federal, private, and state leases would continue under current guidelines and practices. The no action alternative would not preclude these parcels from being nominated and considered in future lease sale.

2.2 Alternative B – Proposed Action

The Proposed Action is to lease twelve (12) nominated parcels of federal minerals, covering 4,391.02 acres administered by the FFO. Standard terms and conditions as well as lease stipulations listed in the RMP would apply. Complete descriptions of these parcels, including stipulations, are provided in Appendix 1 and 2.

Once sold, the lease purchaser has the exclusive right to use as much of the leased lands as is necessary to explore and drill oil and gas within the lease boundaries, subject to the stipulations attached to the lease (Title 43 CFR 3101.1-2).

Oil and gas leases are issued for a 10-year period and continue for as long thereafter as oil or gas is produced in paying quantities. If a lessee fails to produce oil and gas, does not make annual rental payments, does not comply with the terms and conditions of the lease, or relinquishes the lease; exclusive right to develop the leasehold reverts back to the federal government and the lease can be reoffered in another sale.

Drilling of wells on a lease is not permitted until the lease owner or operator secures approval of a drilling permit and a surface use plan specified under Onshore Oil and Gas Orders listed in Title 43 CFR 3162. A permit to drill would not be authorized until site-specific NEPA analysis is conducted.

The twelve (12) parcels contain a Cultural Resources Lease Notice stating that all development activities proposed under the authority of these leases are subject to compliance with Section 106 of the NHPA and Executive Order 13007. In addition, site specific mitigation measures and Best Management Practices (BMPs) would be attached as Conditions of Approval (COAs) for each proposed exploration and development activity authorized on a lease.

The parcels recommended for leasing under the Proposed Alternative are presented below in Table 1. See Appendix 2 for a detailed description of the parcel legals.

Table 1: Alternative B: Proposed Action

Parcel	Comments	Acres
<u>NM-201210-028</u> T.0220N, R.0010W, NM PM, NM, Sec. 004, 005, 009, 016 Sandoval County, Farmington FO	<u>Lease with the following Stipulations:</u> NM-11-LN – Lease Notice-Cultural Resource F-41-LN – Lease Notice-Biological Survey F-8-VRM Visual Resource Management Class IV Objectives	1189.01
<u>NM-201210-029</u> T.0220N, R.0010W, NM PM, NM, Sec. 005, 006, 007, 008 Sandoval County, Farmington FO	<u>Lease with the following Stipulations:</u> NM-11-LN – Lease Notice-Cultural Resource F-41-LN – Lease Notice-Biological Survey F-8-VRM Visual Resource Management Class IV Objectives	1352.88
<u>NM-201210-030</u> T.0220N, R.0010W, NM PM, NM, Sec. 017, 020 NE, E2SE Sandoval County, Farmington FO	<u>Lease with the following Stipulations:</u> NM-11-LN – Lease Notice-Cultural Resource F-41-LN – Lease Notice-Biological Survey F-8-VRM Visual Resource Management Class IV Objectives	300.00
<u>NM-201210-031</u> T.0220N, R.0010W, NM PM, NM, Sec.	<u>Lease with the following Stipulations:</u> NM-11-LN – Lease Notice-Cultural Resource	533.89

021, 028, 029 Sandoval County, Farmington FO	F-41-LN – Lease Notice-Biological Survey F-8-VRM Visual Resource Management Class IV Objectives	
<u>NM-201210-032</u> T.0220N, R.0010W, NM PM, NM, Sec. 033 Sandoval County, Farmington FO	<u>Lease with the following Stipulations:</u> NM-11-LN – Lease Notice-Cultural Resource F-41-LN – Lease Notice-Biological Survey	213.9
<u>NM-201210-033</u> T.0230N, R.0010W, NM PM, NM, Sec. 018 Rio Arriba County, Farmington FO	<u>Lease with the following Stipulations:</u> NM-11-LN – Lease Notice-Cultural Resource F-41-LN – Lease Notice-Biological Survey	40.00
<u>NM-201210-034</u> T.0230N, R.0010W, NM PM, NM, Sec. 019 Rio Arriba County, Farmington FO	<u>Lease with the following Stipulations:</u> NM-11-LN – Lease Notice-Cultural Resource F-41-LN – Lease Notice-Biological Survey	40.00
<u>NM-201210-035</u> T.0250N, R.0020W, NM PM, NM, Sec. 002 Rio Arriba County, Farmington FO	<u>Lease with the following Stipulations:</u> NM-11-LN – Lease Notice-Cultural Resource F-41-LN – Lease Notice-Biological Survey	321.52
<u>NM-201210-036</u> T.0240N, R.0060W, NM PM, NM, Sec. 029 Rio Arriba County, Farmington FO	<u>Lease with the following Stipulations:</u> NM-11-LN – Lease Notice-Cultural Resource F-41-LN – Lease Notice-Biological Survey F-7-VRM Visual Resource Management Class III Objectives	80.00
<u>NM-201210-037</u> T.0240N, R.0060W, NM PM, NM, Sec. 029 Rio Arriba County, Farmington FO	<u>Lease with the following Stipulations:</u> NM-11-LN – Lease Notice-Cultural Resource F-41-LN – Lease Notice-Biological Survey F-7-VRM Visual Resource Management Class III Objectives	80.00
<u>NM-201210-036</u> T.0240N, R.0060W, NM PM, NM, Sec. 029 Rio Arriba County, Farmington FO	<u>Lease with the following Stipulations:</u> NM-11-LN – Lease Notice-Cultural Resource F-41-LN – Lease Notice-Biological Survey F-7-VRM Visual Resource Management Class III Objectives	80.00
<u>NM-201210-046</u> T.0220N, R.0010W, NM PM, NM, Sec. 005 Sandoval County, Farmington FO	<u>Lease with the following Stipulations:</u> NM-11-LN – Lease Notice-Cultural Resource F-41-LN – Lease Notice-Biological Survey F-8-VRM Visual Resource Management Class IV Objectives	159.82

2.2 Alternative C – Preferred Alternative

The Preferred Alternative is the same as the Alternative B – Proposed Action except that one parcel, **NM-201210-035 would be deferred. In addition, F-4-TLS, Timing Limitation Stipulation for Important Seasonal Wildlife Habitat would be modified and added to seven parcels.** The Preferred Alternative is in conformance with the 2003 Farmington RMP.

The BLM would defer one (1) nominated parcel covering 321.52 acres administered by the FFO. Below is the rationale for deferring one (1) parcel:

Parcels -035 is being deferred from this lease sale to the January 16, 2013 Oil & Gas Sale to allow more time to thoroughly review and evaluate the issues raised by the

private surface owners, Michael and Patricia Gold, in their comment letters and protest of the April 2012 Oil & Gas Lease Sale.

While reviewing the proposed parcels, the BLM was made aware of a new elk and deer migration route and wintering habitat between Lajara and Regina. This migration corridor is used in late fall and again in the spring. Human activity during this time may cause an alteration in the elk's normal behavior, resulting in an increased expenditure of energy or putting the animals at greater risk by changing their route. A seasonal timing stipulation of November 15 through March 31 to accommodate the elk migration would minimize impacts to these animals. The intent of the winter closure is to reduce the amount of wildlife disturbance during the critical period of winter months. Therefore, the timing limitation stipulation for important seasonal wildlife habitat that prevents surface disturbing activities, such as pad construction and drilling, from December 1st through March 31st for big game winter range habitat would be slightly modified to account for the annual migration in the Lajara and Regina areas. The timing restraints could be modified by plan maintenance to include the timeframe of November 15th-March 31st for these areas within the Lajara and Regina migration route. The stipulation would not apply to operation and maintenance of existing production facilities and emergencies. This modified stipulation would apply to parcels -029, -030, -031, -032, -033, -034 and -046.

2.3 Alternatives Considered but Eliminated from Detailed Analysis

The alternatives considered but eliminated from detailed analysis identify those parcels that are not in conformance with the current land use plans or need more time for evaluation. Therefore this alternative will not be carried through the remainder of this environmental assessment. Table 2 below identifies those nominated parcels that are not in conformance with current land use plans, and also describes why these parcels were not carried forward into either the proposed alternative or the preferred alternative. See Appendix 2 for a detailed description of the parcel legals.

Table 2 Alternative Considered but Eliminated from Detailed Analysis

Parcel	Explanation	Acres
<u>NM-201210-039</u> T.0200N, R.0090W, NM PM, NM, Sec. 030 McKinley County, Farmington FO	Defer for consultation with the Tribes and the National Park. Parcel is in close proximity to Chaco Canyon National Historic Park.	637.40
<u>NM-201210-040</u> T.0320N, R.0130W, NM PM, NM, Sec. 011 San Juan County, Farmington FO	Closed to Leasing	120.06
<u>NM-201210-041</u> T.0320N, R.0130W, NM PM, NM, Sec. 020 San Juan County, Farmington FO	Closed to Leasing	160.00
<u>NM-201210-042</u> T.0320N, R.0130W, NM PM, NM, Sec.	Closed to Leasing	40.00

021 San Juan County, Farmington FO		
<u>NM-201210-043</u> T.0320N, R.0130W, NM PM, NM, Sec. 032 San Juan County, Farmington FO	Closed to Leasing	80.00
<u>NM-201210-044</u> T.0300N, R.0160W, NM PM, NM, Sec. 023, 024 San Juan County, Farmington FO	Closed to Leasing	320.00
<u>NM-201210-045</u> T.0300N, R.0160W, NM PM, NM, Sec. 026, 027, 034, 035 San Juan County, Farmington FO	Tribal Consultation in progress	640.00

AFFECTED ENVIRONMENT

3.0 Introduction

This section describes the environment that would be affected by implementation of the alternatives described in Section 2. Elements of the affected environment described in this section focus on the relevant resources and issues.

3.1 Air Resources

Air quality and climate are components of air resources which may be affected by BLM applications, activities, and resource management. Therefore, the BLM must consider and analyze the potential effects of BLM and BLM-authorized activities on air resources as part of the planning and decision making process. Additional information on air quality in this area is contained in Chapter 3 of the Farmington Field Office (FFO) Resource Management Plan (RMP) and Final Environmental Impact Statement (FEIS; USDI BLM, 2003) which this analysis tiers to and incorporates. Much of the information referenced in this section is incorporated from the Air Quality Technical Report for BLM Oil and Gas Development in New Mexico, Kansas, Oklahoma, and Texas (herein referred to as Air Quality Technical Report). This document summarizes the technical information related to air resources and climate change associated with oil and gas development and the methodology and assumptions used for analysis.

3.1.1 Air Quality

The Air Quality Technical Report describes the types of data used for description of the existing conditions of criteria pollutants (USDI BLM 2011), how the criteria pollutants are related to the activities involved in oil and gas development (USDI BLM 2011), and provides a table of current National and state standards. EPA's Green Book web page (EPA, 2010a) reports that all counties in the Farmington Field Office area are in attainment of all National Ambient Air Quality Standards (NAAQS) as defined by the Clean Air Act. The area is also in attainment of all state air quality standards (NMAQS). *The current status of criteria pollutant levels in the Farmington Field Office are described below. Total emissions of criteria pollutants from each*

source sector were calculated by adding together the emissions from the four counties that are located in FFO: San Juan, McKinley, Rio Arriba, and Sandoval.

Table 3.1 shows monitored values for ozone in recent years for each of the three San Juan County ozone monitoring stations. Table 3.2 summarizes monitored values for other criteria pollutants in San Juan County.

Table 3.1: Ozone monitored values in San Juan County

NMAQB Air Monitoring Station	8-hour Ozone Design Value (ppm)		NAAQS (2008)
	2007-2009	2008-2010	
Substation	0.067	0.063	0.075
Bloomfield	0.061	0.060	0.075
Navajo Lake	0.069	0.066	0.075

(NMED, 2009)

Table 3.2 Criteria Pollutant monitored values in San Juan County

Pollutant	Range of values	Averaging Time	Observation Period	NAAQS	NMAAQS
NO ₂	5-20 ppb	Annual	1997-2008	53 ppb	50 ppb
CO	1-4 ppm	8 hr	1990-2000	9 ppm	8.7 ppm
PM ₁₀	25-65 µg/m ³	24 hr	1990-2008	150 µg/m ³	*150 µg/m ³
PM _{2.5}	5-6 µg/m ³	Annual	2000-2008	15 µg/m ³	*60 µg/m ³
SO ₂	0-0.0175 ppm	Annual	1996-2009	0.03 ppm	0.02ppm

(EPA, 2010b; 20.2.3 NMAC) *Total Suspended Particulates

In 2005, the EPA estimates that there was less than 0.01 ton per square mile of lead emitted in FFO counties, which is less than 2 tons total (EPA, 2010b). Lead emissions are not an issue in this area, and will not be discussed further.

3.1.1.2 Hazardous Air Pollutants

The Air Quality Technical Report discusses the relevance of hazardous air pollutants (HAPs) to oil and gas development and the particular HAPs that are regulated in relation to these activities (USDI BLM 2011). The EPA conducts a periodic National Air Toxics Assessment (NATA) that quantifies HAP emissions by county in the U.S. The purpose of the NATA is to identify areas where HAP emissions result in high health risks and further emissions reduction strategies are necessary. A review of the results of the 2005 NATA shows that cancer, neurological and respiratory risks in San Juan County are generally lower than statewide and national levels as well as those for Bernalillo County where urban sources are concentrated in the Albuquerque area (EPA, 2011a).

3.1.2 Climate

The planning area is located in a semiarid climate regime typified by dry windy conditions and limited rainfall. Summer maximum temperatures are generally in the 80s or 90s (Fahrenheit) and winter minimum temperatures are generally in the teens to 20s. Temperatures occasionally

reach above 100 °F in June and July and have dipped below zero in December and January. Precipitation is divided between summer thunderstorms associated with the Southwest Monsoon and winter snowfall as Pacific weather systems drop south into New Mexico. Table 3.3 shows climate normals for the 30 year period from 1981-2010 for Chaco Canyon National Monument Lindrith, and Lybrook, which are the closest observation sites to the proposed lease parcels for which normal are available.

Table 3.3. Climate Normals 1981-2010 (NOAA, 2011).

Chaco Canyon	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Temperature (°F)	28.5	34.1	40.9	48.5	57.8	67	72.7	70.4	62.6	50.2	37.9	29.1
Avg Max Temperature (°F)	43.6	49.1	58	66.7	76.7	86.3	89.8	86.9	80.3	68.1	54.5	44.0
Avg Min Temperature (°F)	13.4	19.1	23.8	30.4	38.9	47.7	55.6	53.9	45	32.3	21.3	14.2
Avg Precipitation (inches)	0.68	0.63	0.62	0.63	0.48	0.51	1.37	1.36	1.15	0.81	0.71	0.67
Lindrith	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Temperature (°F)	25.4	28.9	36.3	42.9	52.6	62.8	68.0	65.6	58.4	46.9	34.5	26.2
Avg Max Temperature (°F)	39.9	43.0	51.1	59.4	69.3	80.5	84.4	81.2	74.8	63.3	49.4	40.3
Avg Min Temperature (°F)	10.9	14.8	21.5	26.5	35.9	45.2	51.7	50.1	41.9	30.5	19.6	12.2
Avg Precipitation (inches)	1.20	0.99	1.31	0.94	0.79	0.98	2.20	2.34	1.47	1.19	0.93	1.03
Lybrook	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Temperature (°F)	27.5	31.8	39.1	46.7	55.9	65.9	70.2	67.7	61.1	49.4	37.1	28.2
Avg Max Temperature (°F)	38.4	42.6	50.7	59.6	69.5	79.6	83.6	80.6	73.9	61.7	48.8	39.2
Avg Min Temperature (°F)	16.5	20.9	27.4	33.8	42.2	52.2	56.8	54.8	48.4	37.1	25.4	17.3
Avg Precipitation (inches)	0.72	0.65	0.50	0.69	0.65	0.63	1.32	2.00	1.46	1.00	0.58	0.64

The planning area is located in a semiarid climate regime typified by dry windy conditions, limited rainfall. Table 3.3 summarizes climate in the region.

3.3 Heritage Resources

3.3.1 Cultural Resources

When a lessee proposes to explore or develop its lease, an area-specific cultural records review would be done, in accordance with Section 106 of the National Historic Preservation Act (NHPA), to determine if there is a need for a cultural inventory of the areas that could be affected by the proposed surface disturbing activities. Generally, a cultural inventory will be required and all historic and archeological sites that are eligible for listing in the National Register of Historic Places (NRHP) or potentially eligible to be listed would be either avoided by the undertaking or have the information in the sites extracted through archeological data recovery prior to surface disturbance.

The nominated parcels are located within the archaeologically rich San Juan Basin of northwestern New Mexico. In general, the prehistory of the San Juan Basin can be divided into

five major periods: PaleoIndian (ca. 10000 B.C. to 5500 B.C.), Archaic (ca. 5500 B.C. to A.D. 400), Basketmaker II-III and Pueblo I-IV periods (A.D. 1-1540), and the historic (A.D. 1540 to present), which includes Native American as well as later Hispanic and Euro-American settlers. Detailed description of these various periods and select phases within each period is provided in the Bureau of Land Management Farmington Field Office Final Environmental Impact Statement and Resource Management Plan (2003) and will not be reiterated here. Additional information is also included in an associated document (SAIC 2002).

The BLM FFO has categorized variability in archeological sites by major time period, cultural affiliations/components, average size, and occurrence of features in each of the 20 watersheds within the BLM FFO's jurisdiction (BLM 2003:3-88). The parcels lie in the Largo and Rio Puerco watersheds. The watersheds have received extensive amounts of archaeological surveys over the years.

Based on November 2011 ARMS/NMCRIS data, there are a total of 2810 sites have been documented within the Largo watershed and 707 in the Rio Puerco watershed. All 19 categories of sites defined based on temporal/cultural affiliation are represented. The most frequently occurring cultural affiliations recorded are prehistoric Anasazi/Ancestral Pueblo followed by proto-historic Navajo (ca. A.D. 1500 – 1750). Features common to these sites include structures such as pit houses, small pueblos, hogan, sweat lodges, defensive sites, as well as rock art and associated artifact scatters. No sites listed on the National Register of Historic Places are within the proposed leases.

Previous cultural resource studies and surveys in the lease have been generally limited to inspections ahead of oil and gas related activities, such as well locations and pipelines. From a review of available data, there are 10 archaeological sites on record in the proposed leases and approximately 489 acres of the proposed leases (15%) have been inventoried for cultural resources. The figures are most likely slightly higher because not all known surveys have been electronically captured in a GIS environment.

General Land Office maps dating from 1882 and 1913 showed only the occasional road, trail, ditch, fence line, and one house. General Land Office patent records indicate the lands in the affected townships were patented between 1911 and the early 1940s.

Parcel Num	Surface Owner	Parcel Size (ac)	Surveys (ac)	Percent Surveyed	Known Sites	National Register of Historic Places	GLO Map Review
NM-201210-028	BLM/Fee	1189.01	272	23%	2	0	1913 –roads and trails
NM-201210-029	BLM/Fee	1,352.88	38	3%	1	0	1913 – <i>Road from Gallina to Cuba</i>
NM-201210-030	BLM	300	154	51	4	0	1913 –road and fence line

NM-201210-031	BLM/Fee	533.89	5.7	1%	3	0	1913 – roads and trails
NM-201210-032	FEE	213.9	0	0%	0	0	1913 – wagon road, ditch, Lorenzo Gutierrez house
NM-201210-033	FEE	40	0	0%	0	0	1913 –No Structures/Sites
NM-201210-034	FEE	40	0	0%	0	0	1913 –No Structures/Sites
NM-201210-036	BLM	80	0	0%	0	0	1882 –No Structures/Sites
NM-201210-037	BLM	80	7.2	9%	0	0	1882 –No Structures/Sites
NM-201210-038	BLM	80	0	0%	0	0	1882 –No Structures/Sites
NM-201210-046	BLM	159.82	12	8%	0	0	1913 – <i>Road from Gallina to Cuba</i>
TOTALS		3,161.52	488.9	15%	10	0	

3.3.2 Native American Religious Concerns

Traditional Cultural Prosperities (TCPs) is a term that has emerged in historic preservation management and the consideration of Native American religious concerns. TCPs are places that have cultural values that transcend, for instance, the values of scientific importance that are normally ascribed to cultural resources such as archaeological sites.

Native American communities are most likely to identify TCPs, although TCPs are not restricted to those associations. Some TCPs are well known, while others may only be known to a small group of traditional practitioners, or otherwise only vaguely known.

There are several pieces of legislation or Executive Orders that should be considered when evaluating Native American religious concerns. These govern the protection, access and use of sacred sites, possession of sacred items, protection and treatment of human remains, and the protection of archaeological resources ascribed with religious or historic importance. These include the following:

- The American Indian Religious Freedom Act of 1978 (AIRFA; 42 USC 1996, P.L. 95-431 Stat. 469).
 - Possession of sacred items, performance of ceremonies, access to sites
- Executive Order 13007 (24 May 1996).
 - Access and use of sacred sites, integrity of sacred sites
- The Native American Graves Protection and Repatriation Act of 1990 (NAGPRA; 25 USC 3001, P.L. 101-601).
 - Protection, ownership, and disposition of human remains, associated funerary objects, unassociated funerary objects, sacred objects, or objects of cultural

patrimony

- The Archaeological Resources Protection Act of 1979 (ARPA; 16 USC 470, Public Law 96-95).
 - Protection or archaeological resources on Federal and Indian lands

For the Proposed Action, identification of TCPs were limited to reviewing existing published and unpublished literature, and ongoing BLM tribal consultation efforts. There are no known TCP's in the proposed parcels.

3.3.3 Paleontological Resources

The San Juan Basin has been known to be an important area for mammalian and reptilian fossils since the late 1800s. A variety of paleontological resources exist in the planning area, including animal fossils, fossil leaves, palynomorphs, petrified wood, and trace fossils, occurring in the Triassic, Jurassic, Cretaceous, and Tertiary rocks. Dinosaur and other fossils that have made significant contributions to the scientific record have been found and excavated in the FFO area within the past 5 years.

The BLM uses the Potential Fossil Yield Classification (PFYC) system to identify areas with a high potential to produce significant fossil resource (IM 2008-009). This system has ranked all lands within the FFO management area as a Class 5 designation. Class 5 regions are described as being Very High Potential paleontological resource areas, thus requiring an assessment at the project level (IM 2008-009).

3.4 Water Resources

3.4.1 Water Quality – Surface/Ground

The San Juan Basin is underlain by sandstone aquifers and unconsolidated sand and gravel aquifers. The Colorado Plateaus Aquifers are sandstone while the Rio Grande Aquifer system is unconsolidated sand and gravel. The primary Colorado Plateaus Aquifers that underlie the vast majority of the San Juan Basin are the Uinta-Animas Aquifer and the Mesa Verde Aquifer. The quality of groundwater in the San Juan Basin generally ranges from fair to poor. The Uinta-Animas contains fresh to moderate saline water while the quality of the Mesa Verde is extremely variable. In general, areas of the aquifer that are recharged by infiltration from precipitation or surface water sources contain relatively fresh water.

Surface water within the area is affected by geology, precipitation, and water erosion. Factors that currently affect surface water resources include livestock grazing management, oil and gas development, and possible impacts from brush control treatments. No perennial surface water is found on public land in the proposed lease areas. Ephemeral surface water within the area may be located in tributaries, playas, alkali lakes and stock tanks.

Groundwater within the area is affected by geology and precipitation. Factors that currently affect groundwater resources in the area include guzzler/pond, oil and gas development,

groundwater pumping and possible impact from brush control treatments. Most of the groundwater in the area is used for rural, domestic and livestock purposes.

3.4.2 Watershed - Hydrology

The watershed and hydrology in the area is affected by land and water use practices. The degree to which hydrologic processes are affected by land and water use depends on the location, extent, timing and the type of activity. Factors that currently cause short-lived alterations to the hydrologic regime in the area include wildlife grazing management, recreational use activities, groundwater pumping and also oil and gas developments such as well pads, permanent roads, temporary roads, pipelines, and powerlines.

The proposed nominated lease parcels borders the eastern section of the Largo Watershed and the northern section of the Rio Puerco Watershed. The nominated parcels are located in the mid-eastern and south-eastern sections of the FFO administrative area.

The Largo watershed is relatively large and located in the northeast quarter of the planning area. There are no prime farmland soils in this watershed. Approximately half of the largo watershed is severely limited for construction of roads, small buildings, trails, and camp areas primarily due to steep slopes, shallow depth to rock, and low strength. Construction of embankments is limited in about 20 percent of the watershed due to the likelihood of piping, thin soils, difficulty with compaction, and small percentage due to excess salt or sodium.

The Rio Puerco watershed covers approximately 4,736 square miles (mi²) in the southeast quarter of the planning area. There are no prime and unique farmlands on BLM surface with in this watershed. This watershed consists of 62% forest, 21% shrubland, 12% grassland, 4% agriculture, and less than 1% water, wetlands and bare rock. The landownership consists of 44% private land, 23% Tribal, 19% BLM, 7% U.S. Forest Service, and 6% State. Soils range from shallow to very deep depending on topography with the deepest soils in the valley floor and the shallowest on the mountainsides. The Rio Puerco, once the breadbasket of New Mexico, has achieved worldwide notoriety as a severely impacted and degraded watershed, the best case for accelerated erosion (NRCS, Rio Puerco Watershed, HUC8 13020204 page 8).The natural process of erosion has been accelerated by grazing and road construction/maintenance on both private and public lands. The Rio Puerco is one of the main tributaries of the Rio Grande, entering the river near Bernardo. It supplies more than 70% of the suspended sediment entering the Rio Grande above Elephant Butte reservoir (USGS, Rio Puerco Online).

In addition to the many erosion control structures built from the 1950's -1970's, watershed protection and improvement in the watershed continues through implementation of BMPs and watershed restoration and stabilization projects. Other agencies and watershed interest groups as well as the BLM have focused on planning and project efforts to improve watershed conditions, especially in the Rio Puerco watershed. Current management activities include fuels and vegetation treatments, grazing management actions, transportation management, and erosion control projects such as stream stabilization and restoration of disturbed areas (e.g., unused/unneeded dirt roadbeds).

In general, watershed health in New Mexico and the Rio Puerco watershed is improving over time through continuing implementation of both regulatory and non-regulatory programs. In the Rio Puerco watershed, voluntary water quality improvement projects are commonly funded by programs such as the CWA Section 319 grants, agency initiatives, and private land initiatives (e.g., USDA NRCS landowner programs). The adoption of the Standards for Public Land Health and Guidelines for Livestock Grazing Management has provided guidance for assessing potential water quality impairment through observation of erosion potential. Groundwater protection is achieved largely through State of New Mexico drilling regulations for water wells and oil and gas wells, and by controlling surface pollution that could migrate to ground water.

3.5 Floodplains

Executive Order 11988 requires federal agencies to consider and evaluate potential effects that a proposed action may have on floodplains. Where applicable, actions should reduce the risk of flood loss, minimize the impact of floods on human safety and restore and preserve the natural and beneficial values served by floodplains. The best available floodplain information for the Farmington Field Office resource area is the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM).

These maps define zones according to varying levels of flood risk; the zones reflect the severity or type of flooding in the area. The FEMA maps display 100-year floodplains as “Zone A” areas, describing them as areas with a “1% annual chance of flooding and a 26% chance of flooding over [a thirty year period]” (FEMA 2009).

3.6 Soil

The Soil Conservation Service, now the Natural Resource Conservation Service (NRCS), has surveyed the soils in Sandoval and Rio Arriba County. Complete soil information is available in the Soil Survey of Sandoval County and New Mexico Soil Survey of Rio Arriba County, New Mexico, Eastern Part (USDA Soil Conservation Service November 1980). The soil map units represented in the project area are in table 4.

Table 5: Soil Map Data

Parcels	Soils
28, 29, 31, & 32 Sandoval County, Farmington FO	<u>Badland Menefee Complex, 15-35 percent slopes (105)</u> - This soil is found on mountainsides, hill slopes, and mesas. The complex is shallow to very shallow, excessively drained, moderately slow permeability and has a very low available water capacity. It is formed from colluvium over residuum weathered from shale. Water runoff potential is very high and the shrink-swell potential is moderate. The potential plant community is characterized by Sideoats Grama, Blue Grama, Galleta, big Sagebrush, Gambel Oak, Twoneedle Pinyon Rocky Mountain Juniper and Oneseed Juniper.
28, 29, 30, & 31 Sandoval County, Farmington FO	<u>Menefee Clay Loam, 5-35 percent slopes (129)</u> - This soil is found on mountainsides, hill slopes, and mesas. The Menefee is a clay loam that is shallow, well drained, moderately slow permeability and has a low available water capacity. It is formed from colluvium over residuum weathered from shale. Water runoff potential is very high and the shrink-swell potential is moderate. The potential plant community is characterized by Sideoats

	Grama, Blue Grama, Galleta, Big Sagebrush, Gambel Oak, Twoneedle Pinyon and Oneseed Juniper.
28, 30, 32 & 34 Sandoval County, Farmington FO	<u>Pinitos Loam, 1-15 percent slopes (206)</u> - This soil is found on hills, cuestas, fan remnants, and mesas. The Pinitos Loam that is very deep, well drained, moderately slow permeability and the available water capacity is high. It is formed from fan alluvium derived from sandstone and shale. Water runoff potential is medium and the shrink-swell potential is moderate. The potential plant community is characterized by Indian Ricegrass, Blue Grama, New Mexico Feathergrass, Big Sagebrush, Bottlebrush Squirreltail, Western Wheatgrass, Oneseed Juniper, and Twoneedle Pinyon.
46 Sandoval County, Farmington FO	<u>Sparham Silt Loam, 0-3 percent slopes (320)</u> - This soil is found in flood plains, valley sides, and alluvial fans. The Sparham soils are very deep, well drained, and slow permeability. The water capacity and shrink potential is high. The parent material is fan alluvium derived from sandstone and shale.
33 Rio Arriba County, Farmington FO	<u>Sparham Clay Loam, 0-3 percent slopes (70)</u> -The Sparham component consists of 0-3 percent slopes. This component is found in stream terraces and flood plains. The parent material consists of stream alluvium weathered from shale. The soil is very deep, well drained, very slow permeability and has a low water capacity. The potential plant community is characterized by Inland Saltgrass, Sand Dropseed, Alkali Sacaton, Fourwing Saltbush, and Greasewood.
36 Rio Arriba County, Farmington FO	<u>Rock Outcrop-Vessilla-Menefee Complex (220)</u> -The Rock Outcrop-Vessilla-Menefee Complex is comprised of 15 to 45% slopes. The complex is comprised of 40% Rock Outcrop, 15 to 45% slopes; 30% Vessilla sandy loam, 15 to 45% slopes; 20% Menefee clay loam, 15 to 45% slopes; and 10% minor components. The Rock Outcrop consists of barren or nearly barren areas of exposed bedrock on ridges, ledges, and escarpments. Vessilla soils, found on breaks, is shallow and well drained. Permeability is moderately rapid with a very low available water capacity. Effective rooting depth varies from 6 to 10 inches. Runoff is rapid with the potential for water erosion severe. The hazard of soil blowing is severe. Menefee soil, found on breaks, is shallow and well drained. Permeability is slow with a very low available water capacity. Effective rooting depth is 6 to 10 inches. Runoff tends to be rapid with the potential for water erosion severe. The potential for wind erosion is also severe. The unit has limitations due to lack of soil depth and slopes. Roads can be protected from erosion by construction of water bars and be seeding of cuts and fills. Minor components include badlands, 5% and rubble land, 5%. The major use for this soil type is wood products.
36 & 37 Rio Arriba County, Farmington FO	<u>Vessilla-Menefee-Orlie Complex (110)</u> -The Vessilla-Menefee-Orlie Complex, 1 to 30%, slopes is comprised of Vessilla and similar soils, 45%; Menefee and similar soils, 25%; Orlie and similar soils, 20%; and minor components, 10%. Vessilla soils are located on breaks formed from slope alluvium over residuum derived from sandstone. This unit is well drained with a very low water capacity. This unit has moderate permeability and low shrink-swell potential. Menefee soils are located on breaks formed from colluvium over residuum derived from shale, with a 15 to 45% slope. This soil is well drained with a very low water capacity. Runoff for this unit is high and the shrink-swell potential is moderate. Orlie soils, located on summits of plateaus and mesas, formed from slope alluvium derived from sandstone and shale. They have a 1 to 8% slope. This unit is well drained with a high available water capacity. Runoff for this unit is medium and permeability is slow. Minor components consist of Rock outcrop, Pinavetes

	and similar soils, and Gobernador and similar soils. Rock outcrop consists of barren or nearly barren areas of exposed bedrock on ridges, ledges, and escarpments. Pinavetes and similar soils comprise about 3% of the total acreage with a slope of 0 to 3%. Gobernador and similar soils comprise about 3% of the total acreage with a slope of 0 to 3%. Major use of this soil type is grazing and wood products. The major limitation for this soil is water erosion.
<p style="text-align: center;">37 Rio Arriba County, Farmington FO</p>	<p><u>Orlie Fine Sandy Loam (103)</u>-The Orlie fine sandy loam is found on 1 to 8 percent slopes in valley sides and mesa tops. This soil ranges from well drained to somewhat excessively drained valley sides and hillsides. The parent material primarily consists of alluvium and eolian material derived from sandstone and shale. This soil has a deep structure (greater than 60 inches to underlying rock), which is moderately permeable. Available water capacity is very high with a moderate shrink-swell potential. This soil is moderately susceptible to water erosion. The major use of this soil type is livestock grazing. The potential plant community is characterized by western wheatgrass, Indian ricegrass, needleandthread, galleta, and big sagebrush.</p>
<p style="text-align: center;">38 Rio Arriba County, Farmington FO</p>	<p><u>Sparank – San Mateo Silt Loam (10)</u>-The Sparank soils are found on 0 to 3 percent slopes in broad valleys and flood plains. The typical profile is 2 inches of pale brown silt loam and 2 to 60 inches pale brown clay. The parent material is alluvium derived from sandstone and shale. The available water capacity is moderate and the permeability is very slow with a moderate potential for water erosion. This soil is slightly saline and strongly alkaline. The San Mateo silt loam is found in valley floodplains with slopes from 0 to 3 percent. The parent material is alluvium derived from sandstone and shale. The typical profile is 3 inches of brown sandy loam, 3 to 8 inches of pale brown fine sandy loam, 8 to 15 inches of pale brown sandy loam, 15 to 46 inches of brown clay loam, and 46 to 60 inches of pale brown clay loam. The available water capacity is high and the permeability is moderately slow. Potential for water erosion is slight. The major use of this soil type is livestock grazing with a potential plant community of alkali sacaton, western wheatgrass, galleta, bottlebrush squirreltail and four with saltbush, and black greasewood.</p>
<p style="text-align: center;">36 & 38 Rio Arriba County, Farmington FO</p>	<p><u>Pinavetes-Florita Complex (9)</u>-The Pinavetes-Florita complex is found on slopes of 2 to 10 percent on toeslopes of hills and dunes that may be encroaching on hills. The parent material for this soil is alluvium and eolian material derived from sandstone. The typical profile is up to 3 inches of light yellowish brown loamy sand, and then 14 to 26 inches of strong brown loamy sand. This is a deep soil with very pale brown sand from 26 to 60 inches deep. This soil is excessively drained, has a low available water capacity, and is severely susceptible to water erosion. The major use for this soil is livestock grazing with a potential plant community of blue grama, Indian ricegrass, galleta, and western wheatgrass.</p>

3.7 Vegetation

Public lands in San Juan, McKinley, Rio Arriba and Sandoval Counties support a diversity of plant communities. These plant communities developed based on site specific topography, soil type and climatic conditions. The planning area contains five major vegetation units, and a non-

native cover type represented by urban/agricultural areas. Pages 3-31-3-34 and Map 3-6 of the PRMP/FEIS provide further details on vegetation resources in the leasing area.

The nominated parcels are located in the Piñon-Juniper plant and Subalpine Coniferous Forest community. The Piñon-Juniper plant covers 633,000 acres of the northeastern portion of the planning area. The Subalpine Coniferous Forest mostly covers approximately 67,000 acres within the boundaries of the Santa Fe National Forest; however there are distinct characteristics in some of the nominated parcels. The parcels 28, 29, 30, 31, 32, 33, 34, and 46 are located in an area that is intermixed with public and private lands. Many landowners have landscaped yards, orchards, and gardens. These improvements provide for a wide range of vegetation, including both annuals and perennials.

PINON-JUNIPER

The Piñon-Juniper Woodland plant community type occurs primarily in the northeastern portion of the planning area and along the southern boundary. Dense stands generally occur above 6,600 feet in elevation and the dominant tree species are piñon (*Pinus edulis*), Utah juniper, Gambel's oak (*Quercus gambellii*), and true mountain mahogany (*Cercocarpus montanus*), with occasional stringers of ponderosa pine (*Pinus ponderosa*). Common ground cover species are mutton grass (*Poa fendleriana*), western wheatgrass (*Agropyron smithii*), buckwheat (*Eriogonum sp.*), and penstemon (*Penstemon sp.*) (RMP 2003). More open stands are located on drier sites below 6,600 feet elevation where piñon, Utah juniper, big sagebrush and antelope bitterbush (*Purshia tridentata*) are common. Blue grama and galleta are the principal grass species. Relatively large stands of big sagebrush can occur within the open woodlands (RMP 2003).

SUBALPINE CONIFEROUS FOREST

The vegetation unit is characterized by elevations of approximately 9,500 feet to timberline, approximately 12,000 feet (Dick-Preddies 1993). Common flora include Englemann spruce (*Picea englemanii*), Douglas-fir, Juniper species, Corkbark fir (*Albies lasiocarpa*), currants (*Ribes sp.*), fringed brom (*Bromus ciliates*), mountain trisetum (*Trisetum spicatum*), and bluegrass (Dick-Preddie 1993). Vegetation communities vary among different alpine regions due to the elevation and moisture difference.

3.8 Invasive, Non-native Species and Noxious Weeds

When a lessee proposes to explore or develop its lease, an area-specific Invasive and Non native species (Weed) inventory review would be completed to determine if there is a need for a weed inventory of the areas to be affected by surface disturbing activities. Generally, an Invasive and Nonnative species (Weed) inventory would be required.

The presence of those species described in the Noxious Weed List for the State of New Mexico (NMDA, 2009) is detected via continual inventory being carried on by all field going personnel. The inventory process is on-going to detect invasive populations when they are small. Once a population is found, the Bureau coordinates with various agencies, lease operators, and the land user to implement some kind of treatment to remove or control the population.

3.9 Special Status Species

3.9.1 Threatened or Endangered Species

Under Section 7 of the Endangered Species Act of 1973 (as amended), the BLM is required to consult with the U.S. Fish and Wildlife Service on any proposed action which may affect federal listed threatened or endangered species or species proposed for listing. Based on FFO's field inspection and reviews, it was determined that there are no known threatened or endangered species located within the area of analysis. The proposed action would be in compliance with the 2002 Biological Assessment for the 2003 BLM/FFO RMP (Cons. #2-22-01-I-389). No further consultation with the U.S. Fish and Wildlife Service (USFWS) is required at this stage. Any proposed project within the proposed leases would require another effects determination on federally-listed species under Section 7 of the Endangered Species Act. Table 6 lists all the federally-listed and Candidate species in Rio Arriba and Sandoval Counties.

Table 6: Habitat Descriptions and Presence of Federally-Listed Threatened, Endangered, and Candidate Species in Rio Arriba and Sandoval Counties.

Species Name	Conservation Status	Habitat Associations	Potential to Occur in the Proposed Action Area
BIRDS			
Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)	Federal-Endangered	Riparian habitats along rivers, streams, or other wetlands with dense growths of willows or other shrubs and medium sized trees.	There are no riparian habitats suitable for willow flycatchers in the proposed action area.
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	Federal-Endangered	Mature montane forest and in shaded, woody, and steep canyons.	No montane forests are located within the proposed action area.
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Federal-Candidate	Low to mid-elevation riparian woodlands, deciduous woodlands, and abandoned farms and orchards.	There are no large cottonwood galleries in, or near the proposed action area.
Whooping crane (<i>Grus americana</i>)	Experimental, non-essential population; Rocky Mountain population	Nests at shallow diatom ponds that contain bulrush. Migration: wetland mosaics most suitable. Feeding: primarily use shallow, seasonally and semi permanently flooded palustrine wetlands for roosting, and various cropland and emergent wetlands.	No suitable wet areas or cropland occur in or near the analysis area. Rocky Mountain experimental population has been discontinued.
Least tern-interior pop. (<i>Sterna antillarum</i>)	Federal-Endangered	Breeds on sandbars or sandy shorelines along perennial rivers, lakes, and reservoirs east of the Continental Divide and forages over open waters.	There are no perennial water bodies in the proposed action area.
FISH			
Rio Grande cutthroat trout (<i>Oncorhynchus clarki virginalis</i>)	Federal-Candidate	Small streams and Lakes at High Elevations 7500-10750 feet in elevation	There are no perennial high elevation streams or lakes within the proposed action area.
Rio Grande silvery minnow (<i>Hybognathus amarus</i>)	Federal-Endangered	River with silty substrates in eddies, and backwaters of the Rio Grande River and its tributaries.	There are no perennial rivers with eddies and backwaters located in the proposed action area.
Roundtail chub (<i>Gila robusta</i>)	Federal-Candidate	Occurs in cool to warm water, mid-elevation streams and rivers with deep pools adjacent to swifter riffles and runs. Cover is usually present (large boulders, tree rootwads, submerged large trees, etc.)	Proposed action area does not contain suitable habitat.
MAMMAL			
Black footed ferret	Federal-	Grassland plains where it occurs in	No prairie dog colonies are

(<i>Mustela nigripes</i>)	Endangered	association with prairie dogs. At a minimum, the black-footed ferret requires prairie dog towns of at least 80 acres for suitable habitat.	located within the proposed action area.
New Mexico jumping mouse (<i>Zapus hudsonius luteus</i>)	Federal-Candidate	Riparian zones along permanent waterways with dense and diverse vegetation consisting of grasses, sedges, and forbs	No riparian zones occur within the proposed action area.
Gunnison's prairie dog (<i>Cynomys gunnisoni</i>)	Federal-Candidate	Open, brushy country, oft sagebrush with scattered juniper, typically > 5000ft elev.	Proposed action area contains suitable habitat but no known p-dog colonies.
Canada lynx (<i>Lynx canadensis</i>)	Federal-Candidate	Mature subalpine coniferous forests with uneven-aged stands, boulder outcrops, and downed logs.	No subalpine forests occur within the proposed action area; elevation too low. No riparian corridors suitable for migration occur in or near the proposed action area.

3.9.2 Other Special Status Species

In accordance with BLM Manual 6840, the Farmington Field Office of the Bureau of Land Management (FFO) has prepared a list of special management species to focus species management efforts toward maintaining habitats under a multiple use mandate, called FFO Special Management Species (SMS). The BLM manages certain sensitive species not federally listed as threatened or endangered in order to prevent or reduce the need to list them as threatened or endangered in the future. Table 6, listed below, provides an evaluation of the potential for Special Management Species to occur in the proposed action area. The FFO has mapped potential habitats for those species which have readily defined habitat characteristics. A review of the GIS data indicates there are currently no concerns with SMS relative to the lease sale parcel and their potential presence determination is based on evaluation of the proposed action area habitat and the known habitat requirements of the SMS.

Table 7: Habitat Descriptions and Presence of BLM FFO Special Status Species.

Species Name	Conservation Status		Habitat Associations	Potential to Occur in the Proposed Action Area
	BLM/F FO	New Mexico		
Birds				
Golden Eagle (<i>Aquila chrysaetos</i>)	SMS		In the West, mostly open habitats in mountainous, canyon terrain. Nests primarily on cliffs and trees.	Possible: Proposed action area may contain habitat for foraging. No known nests have been documented within lease area.
Ferruginous hawk (<i>Buteo regalis</i>)	SMS		Open, arid country or grasslands with piñon-juniper plant associations. Nests on ledges or cliff sites, may use the ground.	Low: Proposed action area may contain habitat for foraging. No known nests have been documented within lease area.
Prairie falcon (<i>Falco mexicanus</i>)	SMS		Arid, open country, grasslands or desert scrub, rangeland; nests on cliff ledges, trees, power structures.	Possible: Proposed action area does contain habitat for nesting or foraging. No known nests have been documented within lease area.
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	SMS		Low to mid-elevation riparian woodlands, deciduous woodlands, and abandoned farms and orchards. Rare in the San Juan River valley.	Unlikely: Proposed action area does not contain suitable riparian area habitat.

Species Name	Conservation Status		Habitat Associations	Potential to Occur in the Proposed Action Area
	BLM/F FO	New Mexico		
American peregrine falcon (<i>Falco peregrinus anatum</i>)	SMS	NM-T	Open country near lakes or rivers with rocky cliffs and canyons. Tall city bridges and buildings also inhabited.	Possible: Proposed action area may contain suitable habitat for foraging, but not nesting.
Bald eagle (<i>Haliaeetus leucocephalus</i>)	SMS	NM-T	Near lakes, rivers and cottonwood galleries. Nests near surface water in large trees. May forage terrestrially in winter	Unlikely: Proposed action area does not contain suitable habitat for nesting and unlikely any winter foraging habitat.
Mountain plover (<i>Charadrius montanus</i>)	SMS		Semi desert, grasslands, open arid areas, bare fields, breeds in open plains or prairie.	Unlikely: Proposed action area does not contain known suitable nesting habitat.
Burrowing owl (<i>Athene cunicularia</i>)	SMS		Associated with prairie dog towns. In dry, open, short-grass, treeless plains	Possible: Proposed action area does not contain known prairie dog towns for nesting, however, habitat exist within the proposed action area.
Plants				
Brack's hardwall cactus (<i>Sclerocactus cloveriae</i> ssp. <i>brackii</i>)	SMS	NM-E	Sandy clay of the Nacimient Formation in sparse shadscale scrub (5,000-6,000 ft).	Unlikely: Nacimient formation does not occur in the project and action area.
Aztec gilia (<i>Aliciella formosa</i>)	SMS	NM-E	Salt desert scrub communities in soils of the Nacimient Formation (5,000-6,000 ft).	Unlikely: Nacimient formation does not occur in the project and action area.

3.10 Wildlife/Migratory Birds

The Piñon-Juniper plant communities in the northeastern part of the FFO provide habitat for herds of wintering and resident populations of mule deer (*Odocoileus hemionus*) and elk (*Cervus elaphus*). Mule deer and elk are found most often on FFO land north of US Highway 550, and are much less common south of the highway due to the lack of suitable habitat. The BLM lands found in the Lindrith area north of Cuba provide yearlong habitat for a variety of wildlife species but most notably, deer and elk. The area between Lajara and Regina is utilized each fall/spring as a migration corridor for elk that migrate from the San Pedro Parks Wilderness, which is adjacent to the BLM and private lands, on their way to winter range in the Chaco area. Deer also migrate from the surrounding Apache Reservation into the Lindrith area to winter, their numbers vary depending upon the severity of the winter. Deer and elk population density on FFO land varies by location and time of year.

Several small populations of pronghorn antelope (*Antilocapra americana*) reside in the area north and east of US Highway 550 and are much less common south of the highway due to the lack of suitable habitat. Deer and elk population density on FFO land varies by location and time of year.

Detailed information on other wildlife species and habitats in the FFO is contained on pages 3-39 to 3-42 of the PRMP/FEIS and the background biological resources analysis (SAIC 2002) prepared for the RMP.

3.10.1 Migratory Birds

A Memorandum of Understanding (MOU) between the BLM and USFWS dated April 12, 2010 calls for increased efforts to more fully implement the Migratory Bird Treaty Act of 1918. In keeping with this mandate, the BLM/FFO has issued an interim policy to minimize unintentional take as defined by the MOU and to better optimize migratory bird efforts related to BLM/FFO activities (BLM 2010). In keeping with this policy, a list of priority birds of conservation concern which occur in similar eco-regions as the proposed action area was compiled through a review of existing bird conservation plans including:

- Fish and Wildlife Service (USFWS) Birds of Conservation Concern (BCC)
- New Mexico Partners in Flight (NMPF) New Mexico Bird Conservation Plan
- Comprehensive Wildlife Conservation Strategy for New Mexico (CWCS)
- Gray Vireo Recovery Plan
- The North American Waterbird Conservation Plan
- Recovery plans and conservation plans/strategies prepared for federally-listed candidate species.

The selected species have a known distribution in the FFO area within the piñon-juniper vegetation community and may be affected by the proposed action. These species and a brief assessment of their habitat can be found in Table 3 below:

Table 3: Migratory Birds with Potential to Occur in the Proposed Action Area

Species Name	Habitat Associations	Potential to Occur in the Proposed Action Area
Montezuma quail (<i>Cyrtonyx montezumae</i>)	Open oak, pine-oak, or piñon-juniper with well-developed grassy understory; prefers 70% or more tall grass cover.	Lack of significant grassy understory within the analysis area limits habitat.
Broad-tailed hummingbird (<i>Selasphorus platycercus</i>)	Piñon-juniper woodlands, montane riparian areas and thickets, and open, mixed conifer forests.	Piñon-juniper woodland in the analysis area could provide suitable habitat for the species.
Cassin's kingbird (<i>Tyrannus vociferans</i>)	Found in open country with scattered trees (savannahs) or open woodlands including piñon-juniper.	Piñon-juniper/sagebrush edge of the analysis area may provide preferred habitat.
Loggerhead shrike (<i>Lanius ludovicianus</i>)	Open country interspersed with improved pastures, grasslands, and hayfields. Nests in sagebrush areas, desert scrub, and woodland edges.	No open country interspersed with grassy areas occurs in or near the project area.
Gray vireo (<i>Vireo vicinior</i>)	In northern NM, stands of piñon pine and Utah juniper 5800 - 7200 ft, open with a shrub component and mostly bare ground; antelope bitterbrush, mountain mahogany, Utah serviceberry and big sagebrush often present. Broad, flat or gently sloped canyons, in areas with rock outcroppings, or near ridge-tops.	Piñon-juniper woodland in the analysis area could provide suitable habitat for the species.
Plumbeous vireo (<i>Vireo plumbeus</i>)	Denser piñon-juniper woodland at higher elevations (and ponderosa forests) with some deciduous understory.	Low elevation sparse woodland not likely to provide habitat.
Western scrub-jay (<i>Aphelocoma californica</i>)	Scrub and open woodland habitats.	Piñon-juniper woodland in the analysis area could provide suitable habitat for the species.
Piñon jay (<i>Gymnorhinus cyanocephalus</i>)	Piñon-juniper habitat, due to the species' tightly co-evolved relationship with piñon pines.	Piñon-juniper woodland in the analysis area could provide suitable habitat for the species.

Species Name	Habitat Associations	Potential to Occur in the Proposed Action Area
Juniper titmouse (<i>Baeolophus griseus</i>)	Open, mixed woodland areas at mid-elevations, most common where juniper is dominant; high overstory cover; requires large, mature trees for cavity nesting.	Piñon-juniper woodland in the analysis area could provide suitable habitat for the species.
Western bluebird (<i>Sialia mexicana</i>)	Open piñon-juniper, often burned or moderately logged areas; requires larger trees and snags for cavity nesting.	Piñon-juniper woodland in the analysis area could provide suitable habitat for the species.
Mountain bluebird (<i>Sialia currucoides</i>)	Open piñon-juniper woodlands, mountain meadows, and sagebrush shrublands; requires larger trees and snags for cavity nesting.	Piñon-juniper woodland in the analysis area could provide suitable habitat for the species.
Bendire's thrasher (<i>Toxostoma bendirei</i>)	On the Colorado Plateau, inhabits open sagebrush with scattered junipers; sparse or degraded understory, lower elevations.	While juniper does occur in the analysis area, it is associated with piñon in a woodland setting, there is no dry open habitat typical of the preferred habitat.
Virginia's warbler (<i>Vermivora virginiae</i>)	Coniferous woodland or forest mixed with deciduous shrubs or trees; dense understory is critical; steep draws or scrubby hillsides especially favored	Lack of significant deciduous component limits preferred habitat.
Black-throated gray warbler (<i>Dendroica nigrescens</i>)	Large stands of mature piñon-juniper woodland often with brushy undergrowth.	Lack of mature woodland limits preferred habitat.
Black-chinned sparrow (<i>Spizella atrogularis</i>)	Moderately dense montane shrubs from 3-7 ft tall mixed with rocky outcroppings; large grass component and openings.	No montane shrub dominated areas exist in or near the project area.
Cassin's finch (<i>Carpodacus cassinii</i>)	Breeds in higher mountains. Fall and winter moves into lower mountains and foothills, especially areas where piñon pine cone crops are excellent.	Piñon-juniper woodland in the analysis area could provide suitable winter habitat for the species.

3.11 Livestock Grazing

Livestock grazing is authorized by FLPMA, the Taylor Grazing Act of 1937 and the Public Rangelands Improvement Act of 1978. The principle objective of the rangeland program is to promote healthy, sustainable rangeland ecosystems; to accelerate restoration and improvement of public rangeland to properly functioning condition; to promote the orderly use, improvement and development of the public lands.

There are 167 grazing allotments managed by the Farmington Field Office with 351 grazing authorizations that permit cattle, sheep and horse grazing within the resource area. Of the 351 grazing authorizations, 317 are permitted under section 3 of the Taylor Grazing Act. Of the 167 grazing allotments, there are 4 authorizations issued under section 15 of the Taylor Grazing Act to the Navajo Tribe that authorized grazing on 35 allotments.

There are additional permits under section 15 authorizations that permit grazing on 30 allotments in the Lindrith, New Mexico Area. The FFO currently consults with grazing permittees on a site by site basis as part of the APD process. Additional information on the FFO grazing program can be found on pages 3-54 and 3-55 of the PRMP/FEIS.

The proposed nominated parcels, in Sandoval County, encompass multiple grazing allotments. The proposed nominated parcel 28 is located in the Running Water and the Hatch Spring grazing allotments. The proposed nominated parcel 29 is located within the Badland Hills and Jicarilla grazing allotments. The proposed nominated parcel 30 is located in the Running Water, Arroyo,

and Salado Creek grazing allotments. The proposed nominated parcel 31 is located within the Madera, Santos Ninos, and Black Bear grazing allotments. The proposed nominated parcels 36, 37, and 38 are located in the Rancho Largo grazing allotment. The proposed nominated parcel 46 is within Badland Hills grazing allotment. The nominated parcels 32, 33, and 34 are located within privately owned lands. The above information is shown in Appendix 1.

3.12 Visual Resources

The nominated parcels 32, 33, 34 and portions 28, 29, and 31 are not located in an area that has any designated VRM Class. The nominated parcels or portions of parcels are located on private surface. Visual Resource Management (VRM) only applies on public lands and is conducted in accordance with BLM Handbook 8410 and BLM Manual 8411. The nominated parcels or portions of parcels 28, 29, 30, 31 and 46 are located in a VRM Class IV. BLM Handbook 8410 stipulates the objective of VRM Class IV is to allow for major change of the landscape. Management activities may attract attention, and dominate the view of the casual observer. The nominated parcels 36, 37, and 38 are located in a VRM Class III. BLM Handbook 8410 stipulates the objective of VRM Class III is to allow for moderate change of the landscape. Management activities may attract attention, but should not dominate the view of the casual observer.

The BLM has developed a Visual Resource Management (VRM) classification system designed to maintain or enhance visual qualities and describe the different degrees of modification to the landscape. There are four VRM classes (Classes I through IV) which identify suggested degrees of allowed human modification in a landscape. Class I allows the least modification and Class IV allows the most (RMP 2003).

The 2003 RMP based the interim VRM classes on the 1978-80 Visual Resource Inventory (VRI) of the BLM-FFO area (BLM-FFO Interim VRM Office Policy 2011). A VRI is a scenic quality evaluation, a visual sensitivity level analysis, and a delineation of distance zones. The 2003 VRM classifications are still implemented pending the completion of a new VRI that would meet current BLM guidance and its review (RMP 2003).

In 2009, a new VRI was completed for the BLM-FFO area. This VRI indicated that the landscape has changed substantially since the 1978-80 VRI, warranting the need for an amendment to the RMP to address visual resources. Therefore, on June 13, 2011, the BLM-FFO filed a Notice of Intent (FR Doc. 2011-14491) to prepare an RMP amendment and EA for visual resources. The BLM-FFO will continue to honor all valid, existing rights and resource allocations discussed in the RMP (BLM-FFO Interim VRM Office Policy 2011). In the interim, until the amendment has been signed, 2003 VRM and 2009 VRI classifications will both be discussed during the EA process.

The proposed action area of parcels or portions of parcels 28, 29, 30, and 31 are in 2009 VRI Class IV. The proposed parcels 36, 37, and 38 are within in 2009 VRI Class III.

3.13 Recreation

The objective of the BLM-FFO outdoor recreation program is to ensure the continued availability of public lands for an array of resource-dependent recreation opportunities. Recreation use is managed to protect visitors, protect resources, resolve user conflicts, and stimulate the enjoyment of public lands. Recreation SDAs are managed to accommodate a large variety of recreational uses and outdoor recreational experiences. The proposed actions are not within recreation SDAs. BLM-FFO areas located outside of recreation SDAs are managed as Extensive Recreation Management Areas (ERMAs). ERMAs are managed to maintain a freedom of recreation choice with limited regulatory constraints. In ERMAs, few recreation facilities or supervisory efforts exist. Dispersed recreational use in ERMAs may include occasional hunting during the hunting season and casual exploration of the public lands in the area.

The climate, natural landscape, archaeological sites and cultural traditions of the FFO region provide features and attractions for a wide range of activities. Outstanding conditions for sporting and recreational pursuits are enjoyed by local residents and regional and out-of state visitors. Activities that are enjoyed include camping, hiking, fishing, nature viewing, sightseeing, horseback riding, mountain biking, motorized sports, and rock climbing.

3.14 Minerals Resources

Mineral resources of the FFO are described in detail on pages 3-4 to 3-15 of the PRMP/FEIS (BLM 2003a). The San Juan Basin in New Mexico is a major contributor to the natural gas supply of the nation. In 1997, almost two-thirds of the natural gas produced in New Mexico came from the RMP planning area.

Oil and gas development began in the FFO administrative area in the 1940s. Today, nearly all of the area with high potential for oil and gas production is under prior existing leases held by production. Spacing requirements for well bores are formation dependent, ranging from 40 acres for Gallup oil wells, to 80 acres for Mesa Verde and Dakota natural gas wells, to 160 acres for Fruitland Coal and Pictured Cliffs natural gas wells. Well density will be dependent on the formation productivity.

Coalbed methane is a more recent development of an unconventional source of natural gas, in that the natural gas is methane associated with coal beds found in the Upper Cretaceous Fruitland Formation. The Fruitland and overlying Kirtland Formation both contain coal beds that are mined for coal-fired power plant. Coalbed methane wells tend to be shallower, especially along the northeastern edge of the basin, and thus extracted large amounts of produced water during production.

The nominated parcels are located in an area that has existing wells and a few plugged and abandon wells. A field inspection on April 16th showed the parcels down by Cuba, NM had access roads in the area, some of which are blocked by locked gates. Parcels 36, 37, and 38 are located in an area that has been highly developed over the years and there are collector roads within the parcel or in the near vicinity. This area generates from the Pictured Cliff, Gallup and Mesa Verde formation. There are no conflicts with any active coal, sand and gravel operations.

3.15 Socioeconomics and Environmental Justice

Executive Order 12898, issued on 11 February 1994, addresses concerns over disproportionate environmental and human health impacts on minority and low-income populations. The impetus behind environmental justice is to ensure that all communities, including minority, low-income, or federally recognized tribes, live in a safe and healthful environment and the January 2012 Oil and Gas Lease Sale will not be out of conformance with this executive order.

The nominated parcels are located outside any environmental and human health impacts on minority and low-income populations.

ENVIRONMENTAL IMPACTS

4.0 Environmental Consequences

4.1 Assumptions for Analysis

The act of leasing the parcel would, by itself, have no impact on any resources in the FFO. All impacts would be linked to as yet undetermined future levels of lease development.

If the lease parcels were developed, short-term impacts would be stabilized or mitigated within five years and long-term impacts are those that would substantially remain for more than five years. Potential impacts and mitigation measures are described below.

Cumulative impacts include the combined effect of past projects, specific planned projects and other reasonably foreseeable future actions such as other infield wells being located within this lease. Potential cumulative effects may occur should an oil and gas field be discovered if this parcel was drilled and other infield wells are drilled within this lease or if this lease becomes part of a new unit. All actions, not just oil and gas development may occur in the area, including foreseeable non-federal actions.

The reasonable and foreseeable development scenario developed for the Farmington RMP forecasted 497 wells would be drilled annually on existing and new leases for Federal minerals. Since 2000, an average of 459 wells has been drilled annually

The reasonable and foreseeable potential full development of the proposed lease sale was reviewed by the Farmington BLM minerals staff. The mineral staff determined that all of the proposed leases would most likely be developed for oil using horizontal drilling techniques, and calculated the number of potential horizontal oil wells that could be drilled in each lease. An emission calculator (see Sec. 4.3.2) was used to estimate emissions for the 27 potential wells.

The surface disturbance assumptions shown in the following estimate impacts associated with oil and gas exploration and development drilling activities for the following parcels:

Parcel #28, 1189.01 acre tract

Considering spacing requirements and potential formation development, a maximum of four horizontal wells may be required to develop this tract from four well pads. The existing access road, pipeline, and power line would be utilized.

4 well pads, 4 wells

- 6 acres of access roads: including road, pipeline ROW, & power line.
- 3 acres of Interim road reclamation.
- 14 acres of Initial well pad.
- 10 acres of Interim well reclamation: reseeding & restabilizing after well pad construction.
- 1 acre per well(s) pad.
- 7.0 acres of Total Long Term Disturbance.

Parcel #29, 1352.88 acre tract

Considering spacing requirements and potential formation development, a maximum of eight horizontal wells may be required to develop this tract from the maximum of eight well pads.

8 well pads, 8 wells

- 12 acres of access roads: including road, pipeline ROW, & power line.
- 4 acres of Interim road reclamation.
- 28 acres of Initial well pads.
- 20 acres of Interim well reclamation: reseeding & restabilizing after well pad construction..
- 1 acres per well(s) pad.
- 16 acres of Total Long Term Disturbance.

Parcel #30, 300.00 acre tract

Considering spacing requirements and potential formation development, a maximum of four horizontal wells may be required to develop this tract from the maximum of four well pads.

4 well pads, 4 wells

- 6 acres of access roads: including road, pipeline ROW, & power line.
- 3 acres of Interim road reclamation.
- 14 acres of Initial well pad.
- 10 acres of Interim well reclamation: reseeding & restabilizing after well pad construction.
- 1 acre per well(s) pad.
- 7.0 acres of Total Long Term Disturbance.

Parcel #31, 533.89 acre tract

Considering spacing requirements and potential formation development, a maximum of 2 horizontal wells may be required to develop this tract from the maximum of 2 well pads.

2 well pads, 2 wells

- 3 acres of access roads: including road, pipeline ROW, & power line.
- 1 acres of Interim road reclamation.

- 7 acres of Initial well pad.
- 5 acres of Interim well reclamation: reseeding & restabilizing after well pad construction..
- 1 acre per well(s) pad.
- 4 acres of Total Long Term Disturbance.

Parcel #32, 213.9 acre tract

Considering spacing requirements and potential formation development, a maximum of one horizontal well may be required to develop this tract from the maximum of 1 well pad.

1 well pad, 1 well

- 1.5 acres of access roads: including road, pipeline ROW, & power line.
- 0.5 acres of Interim road reclamation.
- 3.5 acres of Initial well pad.
- 2.5 acres of Interim well reclamation: reseeding & restabilizing after well pad construction..
- 1 acre for the well pad.
- 2.0 acres of Total Long Term Disturbance.

Parcel #33, 40.00 acre tract

Considering spacing requirements and potential formation development, a maximum of one horizontal well may be required to develop this tract from the maximum of one well pad.

1 well pad, 1 well

- 1.5 acres of access roads: including road, pipeline ROW, & power line.
- 0.5 acres of Interim road reclamation.
- 3.5 acres of Initial well pad.
- 2.5 acres of Interim well reclamation: reseeding & restabilizing after well pad construction..
- 1 acre for the well pad.
- 2.0 acres of Total Long Term Disturbance.

Parcel #34, 40.00 acre tract

Considering spacing requirements and potential formation development, a maximum of one horizontal well may be required to develop this tract from the maximum of one well pad.

1 well pad, 1 well

- 1.5 acres of access roads: including road, pipeline ROW, & power line.
- 0.5 acres of Interim road reclamation.
- 3.5 acres of Initial well pad.
- 2.5 acres of Interim well reclamation: reseeding & restabilizing after well pad construction..
- 1 acre for the well pad.
- 2.0 acres of Total Long Term Disturbance.

Parcel #35, 321.50 acre tract

Considering spacing requirements and potential formation development, a maximum of two horizontal wells may be required to develop this tract from one well pad. The existing access road, pipeline, and power line would be utilized.

1 well pad, 2 wells

- 1.5 acres of access roads: including road, pipeline ROW, & power line.
- 0.5 acres of Interim road reclamation.
- 3.5 acres of Initial well pad.
- 2.5 acres of Interim well reclamation: reseeding & restabilizing after well pad construction.
- 0.5 acres per twinned well(s).
- 2.0 acres of Total Long Term Disturbance.

Parcel #36, 80.00 acre tract

Considering spacing requirements and potential formation development, a maximum of one horizontal well may be required to develop this tract from the maximum of one well pad.

1 well pad, 1 well

- 1.5 acres of access roads: including road, pipeline ROW, & power line.
- 0.5 acres of Interim road reclamation.
- 3.5 acres of Initial well pad.
- 2.5 acres of Interim well reclamation: reseeding & restabilizing after well pad construction..
- 1 acre for the well pad.
- 2.0 acres of Total Long Term Disturbance.

Parcel #37, 80.00 acre tract

Considering spacing requirements and potential formation development, a maximum of two horizontal wells may be required to develop this tract from the maximum of two well pads.

2 well pads, 2 wells

- 3 acres of access roads: including road, pipeline ROW, & power line.
- 1 acres of Interim road reclamation.
- 7 acres of Initial well pads.
- 5 acres of Interim well reclamation: reseeding & restabilizing after well pad construction..
- 1 acre per well(s) pad.
- 4.0 acres of Total Long Term Disturbance.

Parcel #38, 80.00 acre tract

Considering spacing requirements and potential formation development, a maximum of one horizontal well may be required to develop this tract from the maximum of one well pad.

1 well pad, 1 well

- 1.5 acres of access roads: including road, pipeline ROW, & power line.

- 0.5 acres of Interim road reclamation.
- 3.5 acres of Initial well pad.
- 2.5 acres of Interim well reclamation: reseeding & restabilizing after well pad construction..
- 1 acre for the well pad.
- 2.0 acres of Total Long Term Disturbance.

Parcel #46, 159.82 acre tract

Considering spacing requirements and potential formation development, a maximum of two horizontal wells may be required to develop this tract from the maximum of two well pads.

1 well pad, 2 wells

- 3 acres of access roads: including road, pipeline ROW, & power line.
- 1 acres of Interim road reclamation.
- 7 acres of Initial well pads.
- 5 acres of Interim well reclamation: reseeding & restabilizing after well pad construction..
- 1 acre per well(s) pad.
- 4.0 acres of Total Long Term Disturbance.

A total of 27 possible horizontal wells for the nominated parcels may be drilled under a full field development of all geologic formations that may have hydrocarbon potential. If this unlikely situation would occur, the estimated long term surface disturbance would be 52.0 acres for the nominated parcels.

The proposed parcels 28, 29, 31, 32, 33, 34 and 35 offered for lease are on private surface (FEE surface) or a portion of the proposed lease is on private surface. As of this time, there has been two landowners to comment on the parcels. Their concerns have been analyzed in this document (see section 1.3 of this EA for more information). The proposed parcels 46, 28, 29, 30, 31, 36, 37, and 38 are located on federal surface or a portion of the proposed lease is located on federal surface. As of this time, there have not been any objections to leasing this parcel. The mineral estate is owned by the federal government and as such, obligations exist that requires the BLM to lease the tracts for mineral extraction.

4.2 Effects from the No Action Alternative

Under the No Action Alternative, the proposed parcel would not be leased. There would be no subsequent impacts from oil and/or gas construction, drilling, and production activities. The No Action Alternative would result in the continuation of the current land and resource uses in the proposed lease areas. The No Action Alternative is also used as the baseline for comparison of alternatives.

It is an assumption that the No Action Alternative (no lease option) may result in a slight reduction in domestic production of oil and gas. This would likely result in reduced Federal and state royalty income, and the potential for Federal lands to be drained by wells on adjacent private or state lands. Consumption is driven by a variety of complex interacting factors

including energy costs, energy efficiency, availability of other energy sources, economics, demography, and weather or climate. If the BLM were to forego leasing and potential development of those minerals, the assumption is the public's demand for the resource would not be expected to change. Instead, the undeveloped resource would be replaced in the short- and long-term by other sources that may include a combination of imports, using alternative energy sources (e.g. wind, solar), and other domestic production. This displacement of supply would offset any reductions in emissions achieved by not leasing the subject tracts in the short-term.

4.3 Analysis of the Action Alternatives

4.3.1 Air Resources

Methodology and Assumptions for calculating Air pollutant and greenhouse gas emissions are described in the Air Resources Technical Document (USDI BLM, 2011). This document incorporates the sections discussing the modification of calculators developed by the BLM to address emissions for one well. The calculators give an approximation of criteria pollutant, HAP and GHG emissions to be compared to regional and national levels (USDI BLM 2011). Also incorporated into this document are the sections describing the assumptions that the FFO used in developing the inputs for the calculator (USDI BLM 2011).

Leasing the subject tracts would have no direct impacts to air quality. Any potential effects to air quality from sale of lease parcel would occur at such time that the lease is developed. Potential impacts of development of the proposed lease could include increased air borne soil particles blown from new well pads or roads, exhaust emissions from drilling equipment, compressors engines, vehicles, flares, and dehydration and separation facilities, and volatile organic compounds during drilling or production activities.

An emission calculator was used to estimate emissions for the 27 potential wells listed in Section 4.1.

There are three phases in the development of a well that result in different levels of emissions. The first phase occurs during the first year of development and may include pad construction, drilling, completion, interim reclamation, and operation of the completed well. The first year results in the highest level of emissions due to the large engines required during the construction and drilling, and the potential release of natural gas to the atmosphere during completion.

The second phase of the well begins after the well is completed and is put on line for production. Emissions during the production phase may include vehicle traffic, engines to pump oil if necessary, venting from storage tanks, and storage tank heaters. A workover of the well may occasionally be required, but the frequency of workovers is not predictable.

The final phase is to plug and abandon the well and rehab the pad. The life of the well is unknown and emission estimates for this phase are not presented.

FFO estimated the proposed leases could result in 27 horizontal oil wells. However, it is unknown if all the potential wells would be drilled, or how many years may pass during the development of the leases. It is highly improbable that all the wells would be drilled in the same

year. The emission estimates for full lease development are presented for the first year, and for annual production for all 27 potential wells (**See Table 8 A & B**).

4.3.1.1 Criteria Pollutants

The criteria pollutant emission estimates for full lease development are presented for the first year, and for annual production for all 27 potential wells (**See Table 8A&B**). For comparison Table 4.3 shows total human caused emissions for each of the counties in the FFO based on EPAs 2005 emissions inventory (EPA, 2011b).

Table 8 (A)
:
Estimated Emissions for Drilling, Completing, and operating for First Year

			Emissions/ Well Tons NO _x	Emissions/ Well Tons CO	Emissions/Wel l Tons VOC	Emissions/ Well Tons CO _{2eq}
			5.05	1.40	12.4	655
Parcel	Acres	Number of Potential Horizontal Oil Wells	Emissions/ well X Number of potential wells	Emissions/ well X Number of potential wells	Emissions/ well X Number of potential wells	Emissions/ well X Number of potential wells
<u>NM-201210-028</u>	1189.01	4	20.2 Tons	5.6 Tons	49.6 Tons	2,620 Tons
<u>NM-201210-029</u>	1352.88	8	40.4 Tons	11.2 Tons	99.2 Tons	5,240 Tons
<u>NM-201210-030</u>	300.00	4	20.2 Tons	5.6 Tons	49.6 Tons	2,620 Tons
<u>NM-201210-031</u>	533.89	2	10.1 Tons	2.8 Tons	24.8 Tons	1,310 Tons
<u>NM-201210-032</u>	213.90	1	5.05 Tons	1.4 Tons	12.4 Tons	655 Tons
<u>NM-201210-033</u>	40.00	1	5.05 Tons	1.4 Tons	12.4 Tons	655 Tons
<u>NM-201210-034</u>	40.00	1	5.05 Tons	1.4 Tons	12.4 Tons	655 Tons
<u>NM-201210-036</u>	80.00	1	5.05 Tons	1.4 Tons	12.4 Tons	655 Tons
<u>NM-201210-037</u>	80.00	2	10.1 Tons	2.8 Tons	24.8 Tons	1,310 Tons
<u>NM-201210-038</u>	80.00	1	5.05 Tons	1.4 Tons	12.4 Tons	655 Tons
<u>NM-201210-046</u>	159.82	2	10.1 Tons	2.8 Tons	24.8 Tons	1,310 Tons
<u>Totals</u>	4,069.5	11	136.35 Tons	37.8 Tons	334.8 Tons	17,685 Tons

Table 8 (B)
Estimated Emissions for annual operations

			Emissions/ Well Tons NO _x 0.0004	Emissions/ Well Tons CO 0.0002	Emissions/Wel l Tons VOC 0.72	Emissions/ Well Tons CO _{2eq} 1.10
Parcel	Acres	Number of Potential Horizontal Oil Wells	Emissions/ well X Number of potential wells	Emissions/ well X Number of potential wells	Emissions/ well X Number of potential wells	Emissions/ well X Number of potential wells
<u>NM-201210-028</u>	1189.01	4	0.0016 Tons	0.0008 Tons	2.88 Tons	4.4 Tons
<u>NM-201210-029</u>	1352.88	8	0.0032 Tons	0.0016 Tons	5.76 Tons	8.8 Tons
<u>NM-201210-030</u>	300.00	4	0.0016 Tons	0.0008 Tons	2.88 Tons	4.4 Tons
<u>NM-201210-031</u>	533.89	2	0.0008 Tons	0.0004 Tons	1.44 Tons	2.2 Tons
<u>NM-201210-032</u>	213.90	1	0.0004 Tons	0.0002 Tons	0.72 Tons	1.10 Tons
<u>NM-201210-033</u>	40.00	1	0.0004 Tons	0.0002 Tons	0.72 Tons	1.10 Tons
<u>NM-201210-034</u>	40.00	1	0.0004 Tons	0.0002 Tons	0.72 Tons	1.10 Tons
<u>NM-201210-036</u>	80.00	1	0.0004 Tons	0.0002 Tons	0.72 Tons	1.10 Tons
<u>NM-201210-037</u>	80.00	2	0.0008 Tons	0.0004 Tons	1.44 Tons	2.2 Tons
<u>NM-201210-038</u>	80.00	1	0.0004 Tons	0.0002 Tons	0.72 Tons	1.10 Tons
<u>NM-201210-046</u>	159.82	2	0.0008 Tons	0.0004 Tons	1.44 Tons	2.2 Tons
<u>Totals</u>	4,069.5	27	0.0108 Tons	0.0054 Tons	19.44 Tons	29.7 Tons

Table 8c: Area Emissions for 2005

County	NO _x	CO	VOC	PM10	PM2.5	SO ₂
McKinley	7,160.7	28,337.1	2,551.6	243.7	171.1	1,548.1
Rio Arriba	3,010.5	15,419.9	2,935.9	71.0	58.1	22.7
San Juan	33,829.6	45,333.1	5,153.6	1,057.1	862.0	11,408.9
Sandoval	36,767.6	24,737.3	2,216.0	145.2	115.4	35.6

(EPA, 2011b)

While all of San Juan County is in attainment of all NAAQS including ozone, the Navajo Dam monitoring station is the most closely watched due to the current design value of 0.066ppm zone. While 0.066ppm is well below the attainment value of 0.075ppm, it is the highest design value of the three monitoring stations in San Juan County. The Western Regional Climate Center web page lists the prevailing winds at Farmington NM to be easterly in the a.m. hours and westerly in the p.m. hours. The proposed lease parcel is approximately 31 miles south from the Navajo Dam air quality monitoring station established by the New Mexico Environmental Department Air

Quality Bureau. The potential amounts of ozone precursor emissions of NO_x and VOCs are not expected to impact the current design value for ozone in San Juan County, and due to the location of the proposed lease parcel, the emission of ozone precursors NO_x and VOCs resulting from the development of the potential lease will not be analyzed further.

Potential Mitigation: The BLM encourages industry to incorporate and implement “Best Management Practices” (BMPs), which are designed to reduce impacts to air quality by reducing emissions, surface disturbances, and dust from field production and operations. Typical measures include: adherence to BLM’s Notice to Lessees’ (NTL) 4(a) concerning the venting and flaring of gas on Federal leases for natural gas emissions that cannot be economically recovered, flare hydrocarbon gases at high temperatures in order to reduce emissions of incomplete combustion; water dirt roads during periods of high use in order to reduce fugitive dust emissions; collocate wells and production facilities to reduce new surface disturbance; implementation of directional drilling and horizontal completion technologies whereby one well provides access to petroleum resources that would normally require the drilling of several vertical wellbores; require that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored; and perform interim reclamation to re-vegetate areas of the pad not required for production facilities and to reduce the amount of dust from the pads.

An application for permit to drill (APD) is required for each proposed well to develop a lease. Onshore Oil and Gas Order No. 1 issued under 43 CFR 3160 authorizes BLM to attach Conditions of Approval (COA) to APDs during the permitting process. As a result of recommendations from the Four Corners Air Quality Task Force, the New Mexico Environment Department, Environmental Protection Division requested FFO attach a COA to APDs requiring new and replacement internal combustion gas field engines of between 40 and 300 horsepower to emit no more than two grams of nitrogen oxides per horsepower-hour. FFO has included a COA limiting nitrogen oxides since August of 2005.

In 2009, the legislature of New Mexico passed House Bill 195 which enacted a new section of the Air Quality Control Act to provide for regulation of sources of emissions that cause the formation of ozone. If the environmental improvement board determines that emissions from sources within its jurisdiction cause or contribute to ozone concentrations in excess of ninety-five percent of a national ambient air quality standard for ozone, it shall adopt a plan, including regulations, to control emissions of oxides of nitrogen and volatile organic compounds to provide for attainment and maintenance of the standard. At the present time, ozone concentrations in the San Juan Basin are not within 95% of the standard. In the future, if the ozone concentrations are within 95% of the standard, FFO will cooperate with the State of New Mexico to develop appropriate COAs to attach to APDs that may result from the proposed lease sale.

The FFO recently purchased an infrared camera designed to detect natural gas leaks on and around well pad and pipeline facilities. FFO inspection personnel have been trained to operate the camera and FFO is currently developing a strategy to implement the use of the camera in cooperation with oil and gas operators to detect and eliminate natural gas leaks in well pad and pipeline infrastructure.

The majority of the large natural gas producers in the area are members of the Gas STAR program that is administered by EPA. These members of the Gas STAR program operate 78% of the federal wells in the San Juan Basin. Natural Gas STAR is a flexible, voluntary partnership that encourages oil and natural gas companies to adopt proven, cost-effective technologies and practices that improve operational efficiency and reduce natural gas emissions.

4.3.1.2 Greenhouse Gases

Information about (GHGs) and their effects on national and global climate is presented in the Air Quality Technical Report (USDI BLM 2011). Analysis of the impacts of the proposed action on GHG emissions will be reported below. Only the GHG emissions associated with exploration and production of oil and gas will be evaluated here because the environmental impacts of GHG emissions from oil and gas consumption, such as refining and emissions from consumer-vehicles, are not effects of the proposed action as defined by the Council on Environmental Quality because they do not occur at the same time and place as the action. Thus, GHG emissions from consumption of oil and gas do not constitute a direct effect that is analyzed under NEPA. Nor is consumption an indirect effect of oil and gas production because production is not a proximate cause of GHG emissions resulting from consumption. However, emissions from consumption and other activities are accounted for in the cumulative effects analysis.

Leasing the subject tracts would have no direct impacts to climate change as a result of GHG emissions. Any potential effects to air quality from sale of the lease parcel would occur at such time that the lease was developed. The potential full development of the proposed lease sale is estimated at 6 horizontal oil wells (4.23 Cumulative Impacts). .

The two primary GHGs associated with the oil and gas industry are carbon dioxide (CO₂) and methane (CH₄). Because methane has a global warming potential that is 21-25 times greater than the warming potential of CO₂, the EPA uses measures of CO₂ equivalent (CO₂e) which takes the difference in warming potential into account for reporting greenhouse gas emissions. Emissions will be expressed in metric tons of CO₂ equivalent in this document.

Oil and Gas production in New Mexico is concentrated in the northwest corner, the San Juan Basin, and the southeast corner, the Permian Basin. Production in the San Juan Basin is mostly natural gas while production in the Permian Basin is mostly oil. Production statistics developed from EPA and New Mexico Oil Conservation Division for 2008 are shown in Table 9 for the US, New Mexico and for wells on federal leases in each basin.

Table 9: 2008 Oil and Gas Production

	Oil Barrels (bbl)	% U.S. Total	Gas (MMcf)	% U.S. Total
United States	1,811,816,000	100	25,754,348	100
New Mexico	60,178,252	3.32	1,473,136	5.72
Federal leases in New Mexico	25,700,000	1.42	920,000	3.57
San Juan Basin	1,600,000	0.09	709,000	2.75
Permian Basin	24,100,000	1.33	211,000	0.82

Table 10: 2008 Oil and Gas Field Production Emissions

	Oil		Gas		Total O&G Production	%U.S. Total GHG missions
(Metric Tons CO ₂ ^e)	CO ₂	CH ₄	CO ₂	CH ₄		
United States	500,000	28,400,000	8,500,000	14,100,000	51,500,000	0.74
New Mexico	16,607	943,287	486,196	806,513	2,252,603	0.03
Federal leases in New Mexico	7,092	402,844	303,638	503,682	1,217,257	0.02
San Juan Basin	442	25,080	233,999	388,164	647,684	0.01
Permian Basin	6,651	377,765	69,639	115,518	569,573	0.01

Table 10 shows the estimated greenhouse gas emissions for oil and gas field production for the U.S., New Mexico, and Federal leases by basin. Because oil and gas leaves the custody and jurisdiction of the BLM after the production phase and before processing or refining, only emissions from the production phases are considered here. It should also be remembered that following EPA protocols, these numbers do not include fossil fuel combustion which would include such things as truck traffic, pumping jack engines, compressor engines and drill rig engines. Nor does it include emissions from power plants that generate the electricity used at well sites and facilities. Note that units of Metric tons CO₂^e have been used in Table 10 to avoid very small numbers. For comparison one million metric tons is equal to one teragram.

Table 10 provides an estimate of direct emissions that occur during exploration and production of oil and gas. This phase of emissions represents a small fraction of overall emissions of CO₂^e from the life cycle of oil and gas. For example, acquisition (drilling and development) for petroleum is responsible for only 8% of the total CO₂^e emissions, whereas transportation of the petroleum to refineries represents about 10% of the emissions, and final consumption as a transportation fuel represents fully 80% of emissions (U.S.DOE, NETL, 2008).

To develop a more detailed estimate of the potential emissions from the proposed lease sale, an estimate of emission per well is useful. Unlike the estimate based on production presented in Table 4.5, this estimate includes emissions from the burning of fossil fuel in some aspects of construction and production. As described above, the information and assumptions from the Air Resources Technical Document (USDI BLM, 2011) and the calculators were used to estimate these emissions.

The calculator was used to estimate GHG emissions for the first year of operation and annual operations for a potential horizontal oil well. The first year emission estimates includes pad construction, well drilling, completion activities, road traffic, and well operations. The annual operation emission estimate includes fugitive gas, and road traffic. Emissions per well for the first year are estimated at 655 metric tons CO₂e, and annual operations are estimated at 1.1 metric tons CO₂e per year.

Table 11: Comparison of Potential Greenhouse Gas Emissions Resulting from Proposed Lease Sale Referenced to Total U.S. Emissions from all Sources from EPA GHG 2009 Inventory.

Total U.S. GHG Emissions From All Sources	6,639,700,000 metric tons	100.00 %
Total Estimated GHG Emissions From Oil & Gas from initial construction and first year operation (27) wells compared to total U.S. GHG Emissions from all sources	17,685 metric tons	.0000027%
Total Estimated GHG Emissions From Annual Operations (27) wells compared to total U.S. GHG Emissions from all sources	29.7 metric tons	.000000004%

Potential Mitigation: The EPA’s inventory data describes “Natural Gas Systems” and “Petroleum Systems” as the two major categories of total US sources of GHG gas emissions. The inventory identifies the contributions of natural gas and petroleum systems to total CO₂ and CH₄ emissions (natural gas and petroleum systems do not produce noteworthy amounts of any of the other greenhouse gases). Within the larger category of “Natural Gas Systems”, the EPA identifies emissions occurring during distinct stages of operation, including field production, processing, transmission and storage, and distribution. “Petroleum Systems” sub-activities include production field operations, crude oil transportation and crude oil refining. Within the two categories, the BLM has authority to regulate only those field production operations that are related to oil and gas measurement, and prevention of waste (via leaks, spills and unauthorized flaring and venting).

The BLM encourages industry to incorporate and implement “Best Management Practices” (BMPs), which are designed to reduce impacts to GHG emissions from field production and operations. Typical measures include: adhere to BLM’s Notice to Lessees’ (NTL) 4(a) concerning the venting and flaring of gas on Federal leases; for natural gas emissions that cannot be economically recovered, flare hydrocarbon gases at high temperatures in order to reduce emissions of incomplete combustion; implement directional drilling and horizontal completion technologies whereby one well provides access to petroleum resources that would normally require the drilling of several vertical wellbores; and require that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored.

The EPA data show that improved practices and technology and changing economics have reduced emissions from oil and gas exploration and development (Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006). One of the factors in this improvement is the adoption by industry of the BMPs proposed by the EPA’s Natural Gas Energy Star program. The Farmington Field Office will work with industry to facilitate the use of the relevant BMPs for operations proposed on Federal mineral leases where such mitigation is consistent with agency policy.

4.4 Heritage Resources

4.4.1 Cultural Resources

While the act of leasing a parcel would produce no impacts, subsequent development of the lease could have impacts on archaeological resources. Required archaeological surveys would be

conducted upon all subsequent actions that are expected to occur from the lease sale to avoid disturbing cultural resources.

Potential threats to cultural resources from leasing are variable and dependent upon the nature of the cultural resource and the nature of the proposed development. Effects normally include alterations to the physical integrity of a cultural resource. The greatest potential impact to cultural resources stems from the construction of associated lease related facilities such as pipelines, power lines, roads, and well locations. If a cultural resource is significant for other than its scientific information, effects may also include the introduction of audible, atmospheric, or visual elements that are out of character for the cultural site and diminish the integrity of those criteria that make the site significant.

A potential effect from the proposed action is the increase in human activity or access to the area with the increased potential of unauthorized removal or other alteration to cultural resources in the area. These impacts could include altering or diminishing the elements of a National Register eligible property and diminish an eligible property's National Register eligibility status. Conversely, cultural resource investigations associated with development potentially adds to our understanding of the prehistory/history of the area under investigation and discovery of sites that would otherwise remain undiscovered due to burial or omission during review inventories.

Potential Mitigation: Specific mitigation measures, including, but not limited to, possible site avoidance or excavation and data recovery would have to be determined when site-specific development proposals are received. Provided that Class III cultural resource inventories are conducted as lease development takes place and avoidance measures associated with the preservation of cultural resources are proposed and stipulated during development, there does not appear to be any adverse impacts to cultural resources from leasing. In the event that sites cannot be avoided, mitigating measures will be developed in consultation with Native American tribes that ascribe affiliation or historical relationships to those sites.

4.4.2 Native American Religious Concerns

The proposed actions are not known to physically threaten any TCPs, prevent access to sacred sites, prevent the possession of sacred objects, or interfere or otherwise hinder the performance of traditional ceremonies and rituals pursuant to AIRFA or EO 13007. There are currently no known remains that fall within the purview of NAGPRA or ARPA that are threatened by leasing. Use of lease notice NM-11-LN will help ensure that new information is incorporated into lease development. Additional consultation may be initiated at the APD stage of development if BLM professional staff determines it is necessary.

Potential Mitigation: No site-specific mitigation measures for Native American Religious Concerns have been recommended at this time for the proposed parcels recommended to proceed for sale. The proposed parcels recommended to proceed to sale will have the Special Cultural Resource Lease Notice NMLN-11 attached to the lease.

In the event that lease development practices are found in the future to have an adverse effect on Native American TCPs, the BLM, in consultation with the affected tribe, would take action to

mitigate or negate those effects. Measures include, but are not limited to physical barriers to protect resources, relocation of practices responsible for the adverse effects, or other treatments as appropriate.

To be in conformance with the Native American Graves Protection and Repatriation Act of 1991 (Public Law 101-610), the terms and conditions of the lease should contain the following condition: In the event that the lease holder discovers or becomes aware of the presence of Native American human remains within the lease, they shall immediately notify the Bureau of Land Management in writing.||

4.4.3 Paleontological Resources

Surface disturbances associated with oil and gas exploration and development activities have the potential to affect paleontological resources in the areas known to contain or have the potential to contain paleontological resources, primarily the areas identified through the Potential Fossil Yield Classification (PFYC) system. Surface-disturbing activities could potentially alter the characteristics of paleontological resources through damage, fossil destruction, or disturbance of the stratigraphic context in which paleontological resources are located, resulting in the loss of important scientific data. Conversely, surface-disturbing activities could also potentially lead to the discovery of paleontological localities that would otherwise remain undiscovered due to burial or omission during review inventories, providing a better understanding of the nature and distribution of those resources.

Potential Mitigation: Paleontological surveys would be required in areas where the potential for paleontological resources exist to avoid disturbing the paleontological resource. Specific mitigation measures, including, but not limited to, possible site avoidance or excavation would have to be determined when site-specific development proposals are received. However, in most surface-disturbing situations, paleontological resources would be avoided by project redesign or relocation. Should a paleontological locality be unavoidable, properties would be mitigated by data collection and excavation prior to implementation of a project.

4.5 Water Resources

4.5.1 Water Quality: Surface and Groundwater

While the act of leasing a parcel would produce no direct impacts, subsequent development of the lease would lead to surface disturbance from the construction of well pads, access roads, pipelines, and powerlines which can result in degradation of surface water quality and groundwater quality from non-point source pollution, increased soil losses, and increased gully erosion.

Potential impacts that would occur due to construction of well pads, access roads, pipelines, and powerlines include increased surface water runoff and off-site sedimentation brought about by soil disturbance; increased salt loading and water quality impairment of surface waters; channel morphology changes due to road and pipeline crossings; and possible contamination of surface waters by produced water. The magnitude of these impacts to water resources would depend on

the proximity of the disturbance to the drainage channel, slope aspect and gradient, degree and area of soil disturbance, soil character, duration and time within which construction activity would occur, and the timely implementation and success or failure of mitigation measures.

Direct impacts would likely be greatest shortly after the start of construction activities and would likely decrease in time due to natural stabilization, and reclamation efforts. Construction activities would occur over a relatively short period; therefore, the majority of the disturbance would be intense but short lived. Direct impacts to surface water quality would be minor, short-term impacts which may occur during storm flow events. Indirect impacts to water-quality related resources, such as fisheries, would not occur.

Petroleum products and other chemicals, accidentally spilled, could result in surface and groundwater contamination. Similarly, possible leaks from reserve and evaporation pits could degrade surface and ground water quality. Authorization of the proposed projects would require full compliance with BLM directives and stipulations that relate to surface and groundwater protection.

Potential Mitigation: The use of a plastic-lined reserve pits or closed systems or steel tanks would reduce or eliminate seepage of drilling fluid into the soil and eventually reaching groundwater. Spills or produced fluids (e.g., saltwater, oil, and/or condensate in the event of a breach, overflow, or spill from storage tanks) could result in contamination of the soils onsite, or offsite, and may potentially impact surface and groundwater resources in the long term. The casing and cementing requirements imposed on proposed wells would reduce or eliminate the potential for groundwater contamination from drilling muds and other surface sources. Best Management Practices such as storm water management, silt traps, site recontouring, timely reseeding of disturbed areas and soil stabilization, would reduce erosion and sediment migration.

4.5.2 Watershed - Hydrology

While the act of leasing a parcel would produce no impacts, subsequent development of the lease would result in long term and short term alterations to the hydrologic regime. Peak flow and low flow of perennial streams, ephemeral, and intermittent rivers and streams would be directly affected by an increase in impervious surfaces resulting from the construction of the well pad and road. The potential hydrologic effects to peak flow is reduced infiltration where surface flows can move more quickly to perennial or ephemeral rivers and streams, causing peak flow to occur earlier and to be larger. Increased magnitude and volume of peak flow can cause bank erosion, channel widening, downward incision, and disconnection from the floodplain. The potential hydrologic effects to low flow is reduced surface storage and groundwater recharge, resulting in reduced baseflow to perennial, ephemeral, and intermittent rivers and streams. The direct impact would be that hydrologic processes may be altered where the perennial, ephemeral, and intermittent river and stream system responds by changing physical parameters, such as channel configuration. These changes may in turn impact chemical parameters and ultimately the aquatic ecosystem.

Long term direct and indirect impacts to the watershed and hydrology would continue for the life of wells and would decrease once all well pads and road surfacing material has been removed

and reclamation of well pads, access roads, pipelines, and powerlines has taken place. Short term direct and indirect impacts to the watershed and hydrology from access roads that are not surfaced with material would occur and would likely decrease in time due to reclamation efforts.

Potential Mitigation: The operator would stockpile the topsoil from the surface of well pads which would be used for interim and final reclamation of the well pads. Reserve pits would be recontoured and reseeded as described in attached Conditions of Approval. Upon abandonment of the wells and/or when access roads are no longer in service the Authorized Officer would issue instructions and/or orders for surface reclamation/restoration of the disturbed areas as described in the attached Conditions of Approval. During the life of the development, all disturbed areas not needed for active support of production operations should undergo “interim” reclamation in order to minimize the environmental impacts of development on other resources and uses. Site specific mitigations, determined during the onsite, such as proper project placement, storm water management, silt traps, rounding of corners and soil stabilization, would reduce erosion and sediment migration. Earthwork for interim and final reclamation must be completed within 6 months of well completion or well plugging (weather permitting). The operator shall submit a Sundry Notices and Reports on Wells (Notice of Intent), Form 3160-5, prior to conducting interim reclamation.

4.6 Floodplain

The act of leasing Federal minerals produces no impacts to floodplains. However, the subsequent development may produce impacts in the form of surface disturbance. Surface disturbance from the development of well pads, access roads, pipelines, and powerlines can result in impairment of the floodplain values from removal of vegetation, removal of wildlife habitat, impairment of water quality, decreased flood water retention and decreased groundwater recharge.

Potential Mitigation: Surface-disturbing activities will be moved up to 200 meters from floodplains areas. The lease parcel may require a COA for a 200-meter buffer at the APD stage. Site-specific COAs will be incorporated at the APD stage of development.

4.7 Soil

While the act of leasing a tract would produce no direct impacts, subsequent development of the lease would physically disturb the topsoil and would expose the substratum soil on subsequent project areas. Direct impacts resulting from the oil and gas construction of well pads, access roads, and reserve pits include removal of vegetation, exposure of the soil, mixing of horizons, compaction, loss of top soil productivity and susceptibility to wind and water erosion. Wind erosion would be expected to be a minor contributor to soil erosion with the possible exception of dust from vehicle traffic. These impacts could result in increased indirect impacts such as runoff, erosion and off-site sedimentation. Activities that could cause these types of indirect impacts include construction and operation of well sites, access roads, gas pipelines and facilities.

Contamination of soil from drilling and production wastes mixed into soil or spilled on the soil surfaces could cause a long-term reduction in site productivity. Some of these impacts can be reduced or avoided through proper design, construction and maintenance and implementation of best management practices.

Additional soil impacts associated with lease development would occur when heavy precipitation causes water erosion damage. When water saturated segment(s) on the access road become impassable, vehicles may still be driven over the road. Consequently, deep tire ruts would develop. Where impassable segments are created from deep rutting, unauthorized driving may occur outside the designated route of access roads.

Potential Mitigation: The operator would stockpile the topsoil from the surface of well pads in shallow rows which would be used for surface reclamation of the well pads. The impact to the soil would be remedied upon reclamation of well pads when the stockpiled soil that was specifically conserved to establish a seed bed is spread over well pads and vegetation re-establishes. Best Management Practices such as storm water management, silt traps, site recontouring, timely reseeding of disturbed areas and soil stabilization, would reduce erosion and sediment migration.

Reserve pits would be re-contoured and reseeded as described in attached Conditions of Approval. Upon abandonment of wells and/or when access roads are no longer in service the Authorized Officer would issue instructions and/or orders for surface reclamation/restoration of the disturbed areas as described in attached Conditions of Approval. During the life of the development, all disturbed areas not needed for active support of production operations should undergo “interim” reclamation in order to minimize the environmental impacts of development on other resources and uses. Earthwork for interim and final reclamation must be completed within 6 months of well completion or well plugging (weather permitting). The operator shall submit a Sundry Notices and Reports on Wells (Notice of Intent), Form 3160-5, prior to conducting interim reclamation.

Road constructions requirements and regular maintenance would alleviate potential impacts to access roads from water erosion damage. For the purpose of protecting slopes or fragile soils surface disturbance would not be allowed on slopes over 30 percent.

4.8 Vegetation

There would be no direct effects to vegetative resources from the sale of the lease parcel. Subsequent exploration/development of the proposed lease would have indirect impact to vegetation and would depend on the vegetation type, the vegetative community composition, soil type, hydrology, and the topography of the parcel. Oil and gas development surface-disturbing activities could affect vegetation by destroying the vegetation, churning soils, loss of substrates for plant growth, impacting biological crusts, disrupting seedbanks, burying individual plants, reduction of germination rates, covering of plants with fugitive dust, and generating sites for undesirable weedy species. In addition, development could reduce available forage or alter livestock distribution leading to overgrazing or other localized excess grazing impacts to palatable plant species. If these impacts occurred after seed germination but prior to seed set,

both current and future generations could be affected.

Impacts to vegetation depend on development. Vegetation would be lost within the construction areas of pads, roads, and rights of ways. Those areas utilized for well production, such a portion of the well pads and roads, would have no vegetation for the life of the well. These acres should be in adequate vegetative cover in three to five growing seasons and rights-of-ways could re-vegetate in one to two years with proper reclamation and adequate precipitation following interim or final reclamation. Inadequate precipitation over several growing seasons could result in loss of vegetative cover, leading to weed invasion and deterioration of native vegetation.

Potential Mitigation: Mitigation would be addressed at the site-specific APD stage of exploration and development. Needed COAs would be identified and addressed during planning at the APD stage. Mitigation could potentially include revegetation with native plant species, soil enhancement practices, direct live haul of soil material for seed bank revegetation, reduction of livestock grazing, fencing of reclaimed areas, and the use of seeding strategies consisting of native grasses, forbs, and shrubs. Dust abatement on the well pads and along the roads will significantly reduce the amount of fugitive dust released from oil and gas activities.

4.9 Invasive, Non-native Species

While the act of leasing Federal minerals produces no impacts, subsequent development produces impacts in the form of surface disturbance. The construction of an access road and well pad may unintentionally contribute to the establishment and spread of noxious weeds. Noxious weed seed could be carried to and from the project areas by construction equipment, the drilling rig and transport vehicles.

The main mechanism for seed dispersion on the road and well pad is by equipment and vehicles that were previously used and or driven across or through noxious weed infested areas. The potential for the dissemination of invasive and noxious weed seed may be elevated by the use of construction equipment typically contracted out to companies that may be from other geographic areas in the region. Washing and decontaminating the equipment prior to transporting onto and exiting the construction areas would minimize this impact.

Impacts by noxious weeds would be minimized due to requirements for the company to eradicate the weeds upon discovery. Multiple applications may be required to effectively control the identified populations.

Potential Mitigation: In the event noxious weeds are discovered during construction of any access roads and well pads, mitigation would be deferred to the site specific development at the APD stage. Best management practices (BMPs) would be incorporated into the conditions of approval (COAs) of an approved APD.

4.10 Special Status Species

4.10.1 Threatened or Endangered Species

The FFO reviewed and determined that the proposed action is in compliance with listed species management guidelines outlined in the September 2002 Biological Assessment. No further consultation with the USFWS is required.

No known prairie-dog colonies occur within the action area to support black-footed ferret. No large, flat grassland expanse with sparse, short vegetation and bare ground is believed to occur in the action area to support mountain plover. No perennial water resources were present to support Colorado pike minnow or razorback sucker. No riparian habitat was present to support southwest willow flycatcher or yellow-billed cuckoo. The proposed action is not located within designated critical habitat for the Mexican spotted owl or the Colorado pike minnow.

Potential Mitigation: A biological survey may be required to determine any impacts on individual project proposals. Any potential impacts to federally-listed species will be determined based on the biological survey report.

Any biological survey will be conducted by a BLM/FFO approved biologist.

4.10.2 Other Special Status Species

There may be nesting burrowing owls within the proposed lease area. The BLM/FFO has specific management measures to ensure that nesting burrowing owls are protected during the breeding season.

Potential Mitigation: A biological survey may be required to determine any impacts on individual project proposals. Any potential impacts to special status species will be determined based on the biological survey report. A preconstruction survey for burrowing owls may also be required for proposed projects scheduled to be constructed within known habitat (i.e. prairie dog towns) during the nesting season of April 1 to July 31. Occupied burrowing owl nests will not be disturbed within a 50 meters radius from April 1 to August 15. After August 15, any project that will cause destruction of the nest burrow can only begin after confirmation that the nest burrow is no longer occupied.

4.11 Wildlife/Migratory Birds

The types and extent of impacts expected from oil and gas development to wildlife species and habitats from development are similar to those described in the 4.9 Special Status Species Section. Although reclamation and restoration efforts for surface disturbance could provide for the integrity of other resources, these efforts may not always provide the same habitat values (e.g. structure, composition, cover, etc.) in the short or in some instance, the long-term in complex vegetative community types (e.g., shrub oak communities). The short-term negative impact to wildlife would occur during the construction phase of the operation due to noise and habitat destruction.

In general, most wildlife species would become habituated to the new facilities. For other wildlife species with a low tolerance to activities, the operations on the well pad would continue to displace wildlife from the area due to ongoing disturbances such as vehicle traffic, noise and equipment maintenance. The conditions of approval would alleviate most losses of wildlife

species, such as; fencing the reserve pits, netting storage tanks, installation or other modifications of cones on separator stacks, and timing stipulations. The magnitude of above effects would be dependent on the rate and location of the oil and gas development, but populations could likely not recover to pre-disturbance levels until the activity was completed and the vegetative community restored.

While reviewing these proposed parcels, the BLM has been made aware of a new elk and deer migration route and wintering habitat. The area between Lajara and Regina is utilized each fall/spring as a migration corridor for elk that migrate from the San Pedro Parks Wilderness, which is adjacent to the BLM and private lands, on their way to winter range in the Chaco area. Deer also migrate from the surrounding Apache Reservation into the Lindrieth area to winter, their numbers vary depending upon the severity of the winter.

Potential Mitigation: Measures would be taken to prevent, minimize, or mitigate impacts to fish and wildlife animal species from exploration and development activities. Prior to authorization, activities would be evaluated on a case-by-case basis, and the project would be subject to mitigation measures. Mitigation could potentially include rapid revegetation, noise restrictions, project relocation, or pre-disturbance wildlife species surveying.

Parcels 36-38 are not within a wildlife management area and there is not evidence that this area is a critical area for the surrounding wildlife. Parcels that could benefit from a seasonal restriction on drilling and new construction are all of the parcels located between Lajara and Regina i.e. 29-34 and 46. These parcels lie in an elk migration corridor that is used in late fall and again in the spring. Human activity during this time may cause an alteration in the elk's normal behavior, resulting in an increased expenditure of energy or putting the animals at greater risk by changing their route. A seasonal timing stipulation of November 15 through March 31 to accommodate the elk migration would be beneficial to these animals. The intent of the winter closure is to reduce the amount of wildlife disturbance during the critical period of winter months.

Currently FFO has a timing limitation stipulation for important seasonal wildlife habitat that prevents surface disturbing activities, such as pad construction and drilling, from December 1st through March 31st for big game winter range habitat. The dates of this stipulation will need to be slightly modified to account for the annual migration in the Lajara and Regina areas. The timing restraints would be modified by plan maintenance to include a timeframe of November 15th-March 31st for these areas. The stipulation would not apply to operation and maintenance of existing production facilities and emergencies.

4.11.1 Migratory Birds

Actual potential effects on birds in the action area are difficult to predict. Ongoing studies have shown mixed effects of oil and gas development, including compressor noise on nesting migratory birds. Frances and Ortega (2006 unpublished report to BLM/FFO) found no significant difference in nest density or nest success between sites with or without wellhead compressors. Some species, such as black-chinned hummingbird (*Archilocus alexandri*) and house finch (*Carpodacus erythrinus*), were more common on sites with compressors while others, such as mourning dove (*Zenaida macroura*) and spotted towhee (*Pipilo*

erythrophthalmus), appeared to either avoid or nest further from compressors. Holmes *et al.* (2003) found that sage sparrow had lower nest survival in an area with ongoing gas development, while Brewer's sparrow (*Spizella breweri*) had higher survival rates when compared with populations in an undeveloped control area.

Due to the limited scope of the proposed action, the relatively small area of disturbance, and the availability of adjacent suitable habitat, the anticipated effects on migratory bird populations and species as a whole would be low in the short term and long term. Site specific analysis will be conducted to determine the impacts on migratory birds.

Potential Mitigation: All construction activities will be confined to the permitted areas only. Site specific mitigation measures designed to protect migratory birds will be implemented to decrease direct impacts to nesting birds. If an active nest is observed during construction, construction activities that could result in take as defined by the MBTA would halt until practicable or reasonable avoidance alternatives are identified, the birds have fledged, or a migratory bird take permit has been granted from the USFWS. Any proposed action that would result in more than four acres of new surface disturbance; a preconstruction migratory bird nest survey may be required per BLM/FFO Instruction Memorandum No. NM-F00-2010.

4.12 Livestock Grazing

Oil and gas development could result in a loss of vegetation for livestock grazing (e.g., direct removal, introduction of unpalatable plant species, etc.), decrease the palatability of vegetation due to fugitive dust, disrupt livestock management practices, involve vehicle collisions, and decrease grazing capacity. These impacts could vary from short-term impacts to long-term impacts depending on the type of exploration or development, the success of reclamation, and the type of vegetation removed for the oil and gas activities.

Potential Mitigation: Measures would be taken to prevent, minimize, or mitigate impacts to livestock grazing from exploration and development activities. Prior to authorization, activities would be evaluated on a case-by-case basis, and the project would be subject to mitigation measures. Mitigation could potentially include contacting the grazing allottee and or Tribal Chapter House, controlling livestock movement by maintaining fence line integrity, fencing of facilities, revegetation of disturbed sites, installation of cattleguards, and fugitive dust control.

4.13 Visual Resources

Visual resource management is divided into four VRM classes. In the tracts proposed for leasing, VRM class III are represented for parcels 36, 37, and 38 that has the BLM surface. The nominated parcels or portions of parcels 28, 29, 30, and 31 are located in a VRM Class IV. The nominated parcels 32, 33, 34 and portions 28, 29, and 31 are not located in an area that has any designated VRM Class. The nominated parcels or portions of parcels are located on private surface, and VRM is not applied to private surface.

BLM Handbook 8410 stipulates the objective of VRM Class IV is to allow for major change of the landscape. VRM Class IV allows for management activities which require major modifications of the existing character of the landscape. Management activities may attract attention, and dominate the view of the casual observer. Site specific mitigation may still be applied to proposed projects at the onsite stage.

The VRM Class III objective is to partially retain existing landscape character. The level of change to the characteristic landscape could be moderate. Management activities may attract attention but should not dominate a casual observer's view. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

The construction of an access road, well pad and other ancillary facilities, other than facilities greater in height than eight feet, would modify the existing area visual resources. Facilities, such as condensate and produced water or oil storage tanks that rise above eight feet, would provide a geometrically strong vertical and horizontal visual contrast in form and line to the characteristic landscape and vegetation, which have flat, horizontal to slightly rolling form and line. Under visual resource Class III, the method for repeating the basic elements would be to remove strong vertical and horizontal contrast through use of low-profile facilities as reflected in the Farmington RMP (1997, p. AP1-4).

Depending on the production nature of the well site, multiple tanks such as condensate, oil or produced water tanks would be necessary to accommodate the project. Visual impacts can be mitigated by color manipulation, by painting well facilities to blend with the surrounding vegetation and/or landform setting, the view is expected to favorably blend with the form, line, color and texture of the existing landscape. A site specific color will be chosen during the onsite and all facilities, including the meter building, would be painted this color. Cumulative adverse visual impacts can be avoided by gradually moving into a more appropriate vegetative/landform setting color scheme. Low profile equipment, tree screens, and proper project placement, can also reduce the visual impacts.

Potential Mitigation: Special painting schemes may be required for all facilities to closely approximate the vegetation within the setting. All facilities, including the meter building, would be painted to blend with the surrounding vegetation. If the proposed project is determined to be in a scenic area, site specific COAs, proper project placement, tree screen, low profile equipment, may be required for the proposed action.

4.14 Recreation

While the act of leasing Federal minerals produces no direct impacts, subsequent development of a lease would generate impacts to recreation activities. In public land that are small or land locked by allotted, private or state land, recreation opportunities that could occur in this area would be limited or non-existent due to land patterns. In isolated tracks of public land that generally do not have access through allotted land, state land or county or state roads, oil and gas activities would have little or no effect on the recreational opportunities in this area.

Future development of leased parcels could affect recreation by limiting access to public lands. Construction, drilling, and production of future projects could result in increased human activity, construction activity, and production activity and equipment in the area. Noise levels within the area would probably increase moderately during construction and drilling of the proposed well. Long-term increases in noise would be low. Equipment and activities would also similarly increase visual disturbance in the immediate area with moderate short-term and low long-term effects. A potential indirect effect would be the displacement of some wildlife species from the area surrounding future development locations. This could detract from the recreational experience for those recreational visitors hoping to encounter such wildlife. Neither of the proposed parcels are located within a Recreation SDA.

Potential Mitigation:

Although people will be refrained from areas in which construction and drilling activities are occurring, it will be a relatively short period of time and for their safety. Conditions of approval (COAs) and Best Management Practices (BMPs) will be applied at the APD stage to help reduce impacts to the public and environment.

4.15 Minerals Resources

If the proposed parcels are leased, it is estimated that there will be a maximum of 27 well pads to accommodate the mineral extraction by horizontally drilling. Some of the proposed parcels are too small to accommodate a horizontal well. It is assumed that the surrounding minerals have been leased and that they will be combined in a Com Agreement or Unitized. The amount and location of direct and indirect effects cannot be predicted until the site-specific APD stage of development. The parcels appear to present no conflict with the development of other mineral resources such as coal or sand and gravel.

Potential Mitigation: Potential mitigation is deferred to the site-specific APD stage of development. Spacing orders and allowable production orders are designed to conserve the oil and/or gas resource and provide maximum recovery.

4.16 Socio-economics and Environmental Justice

No minority or low income populations would be directly affected in the vicinity of the proposed actions from subsequent proposed oil or gas projects. Indirect impacts could include a small increase in activity and noise disturbance in areas used for wildlife grazing, and wood gathering. However, these impacts would apply to all public land users in the project area.

4.17 Cumulative Impacts

The NMSO manages approximately 41 million acres of Federal mineral estate. Of the 41 million acres, 35 million acres are available for oil and gas leasing. Approximately 17% of the 35 million acres is currently leased (73% of the leases are in production and 63% of the lease acres are in production). The NMSO received 55 parcel nominations (24,409.18 acres) for consideration in the October 2012 Oil & Gas Lease Sale, and is proposing to lease 40 (18,166.61 acres) of the 55

parcels. If these 40 parcels were leased, the percentage of Federal minerals leased would not change. The Carlsbad, Roswell and Oklahoma Field Office (Oklahoma and Texas) parcels are analyzed under separate EAs.

Table 5A. Actual - Acres of Federal Minerals/Acres Available/Acres Leased:

State	Federal O&G Mineral Ownership	Acres Available	Acres Leased	Percent Leased
KS	744,000	596,147	129,378	22%
NM	34,774,457	30,699,038	5,140,073	17%
OK	1,998,932	1,810,000	329,765	18%
TX	3,404,298	1,774,545	450,425	25%
Totals/Average	40,921,687	34,879,730	6,049,641	17%

Table 5B. Parcels Nominated & Offered in the July 2012 Oil & Gas Lease Sale:

Field Office	No. of Nominated Parcels	Acres of Nominated Parcels	No. of Parcels to be Offered	Acres of Parcels to be Offered
Carlsbad	24	8,847.02	17	4, 653.43
Roswell	3	1,145.76	3	1,145.76
Farmington	19	6,118.48	11	4,069.5
Texas	7	7,600.60	7	7,600.60
Oklahoma	2	697.32	2	697.32
Totals	55	24,409.18	40	18,166.61

Table 5C. Foreseeable - Acres of Federal Minerals/Acres Available/Acres Leased:

State	Federal O&G Mineral Ownership	Acres Available	Acres Leased	Percent Leased
KS	744,000	596,147	129,378	22%
NM	34,774,457	30,699,038	5,149,942	17%
OK	1,998,932	1,810,000	330,804	18%
TX	3,404,298	1,774,545	458,026	26%
Totals/Average	40,921,687	34,879,730	6,068,150	17%

The cumulative impacts fluctuate with the gradual reclamation of well abandonments and the creation of new additional surface disturbances in the construction of new access roads and well pads. The on-going process of restoration of abandonments and creating new disturbances for drilling new wells gradually accumulates as the minerals are extracted from the land. Preserving as much land as possible and applying appropriate mitigation measures will alleviate the cumulative impacts.

5.1 Effects on Air Resources

The following analysis of cumulative impacts of the proposed action on air quality will be limited to the Four Corners area of New Mexico. The cumulative impacts of GHG emissions

and their relationship to climate change are evaluated at the national and global levels in the Air Resource Technical Report (USDI BLM 2011).

5.1.2 Effects of Other Past, Present, and Reasonably Foreseeable Actions on Air Resources

The primary activities that contribute to levels of air pollutant and GHG emissions in the Four Corners area are electricity generation stations, fossil fuel industries and vehicle travel. The Air Quality Technical Report includes a description of the varied sources of national and regional emissions that are incorporated here to represent the past, present and reasonably foreseeable impacts to air resources (USDI BLM 2011). It includes a summary of emissions on the national and regional scale by industry source. Sources that are considered to have notable contributions to air quality impacts and GHG emissions include electrical generating units, fossil fuel production (nationally and regionally) and transportation.

5.1.3 Cumulative Effects of the Proposed Action on Air Resources

The emissions calculator estimated that there could be an increase of approximately 20 tons of criteria pollutants per year due to annual production of the 27 potential wells (Table 4.2). The 2005 emissions for the same pollutants from (Table 4.4) for San Juan, Rio Arriba, Sandoval, and McKinley counties were approximately 207,447 tons.

The RFDS developed for the 2003 Farmington RMP forecasted 497 wells would be drilled annually on existing and new leases for Federal minerals. Since 2000, an average of 459 wells has been drilled annually and in recent years, many fewer wells have been drilled.

5.1.4 Cumulative Effects of the Proposed Action on Air Quality

The very small increase in emissions that could result from approval of the proposed action would not result in any county in the FFO area exceeding the NAAQS for any criteria pollutants. The applicable regulatory threshold for HAPs is the oil and gas industry National Emissions Standards for Hazardous Air Pollutants, which are currently under review by the EPA. The emissions from the proposed well are not expected to impact the 8-hour average ozone concentrations, or any other criteria pollutants in the Southern San Juan Basin.

5.2 Cumulative Effects of the Proposed Action on Climate Change

The very small increase in GHG emissions that could result from approval of the proposed action would not produce climate change impacts that differ from the No Action Alternative. This is because climate change is a global process that is impacted by the sum total of GHGs in the Earth's atmosphere. The incremental contribution to global GHGs from the proposed action cannot be translated into effects on climate change globally or in the area of this site-specific action. It is currently not feasible to predict with certainty the net impacts from the proposed action on global or regional climate.

The Air Quality Technical Report (USDI BLM, 2011) discusses the relationship of past, present and future predicted emissions to climate change and the limitations in predicting local and

regional impacts related to emissions. It is currently not feasible to know with certainty the net impacts from particular emissions associated with activities on public lands.

5.0 Consultation/Coordination

This section includes individuals or organizations from the public and its' users, external agencies, the interdisciplinary team, and permittees that were contacted during the development of this document

Table 11: Summary of Contacts during preparation of document

ID Team Member	Title	Organization
Jim Copeland	Archaeologist	BLM
John Kendall	T & E Biologist	BLM
Sarah Scott	Natural Resource Specialist	BLM
Dave Maniewicz	Assistant Field Manager, Minerals	BLM
Jeff Tafoya	Range Management Specialist	BLM
Janelle Alleman	Outdoor Planner	BLM
John Hansen	Wildlife Biologist	BLM
Bill Liess	Environmental Protection Specialist	BLM
Barney Wegener	Natural Resource Specialist	BLM
Dale Wirth	Range & Multiple Resource-Branch Chief	BLM
Stan Dykes	Weeds	BLM
Sherrie Landon	Paleontologist	BLM

5.1 Agencies, Persons and Organizations Consulted

Agencies

Thetis Gamberg, USFWS Biologist
Micheal Davis, US Forest Service

New Mexico State Office

Rebecca Hunt, State Natural Resource Specialist
Megan Stouffer, State NEPA Coordinator

On April 23, 2012 a briefing for the BLM NM State Director was held at the New Mexico State Office to review Field Office recommendations for nominated parcels.

5.2 Public Involvement

The nominated parcels for this sale, along with the appropriate stipulations from the RMP were posted online for a two week scoping period April 23- May 7, 2012. Scoping comments were received from two private surface owners (see section 1.3 of this EA for more information). This EA is made available for public review and comment for 30 days beginning May 30 – June 29, 2012. Any comments received will be evaluated and incorporated into the EA as appropriate.

6.0 References

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7.1 Authorities

Code of Federal Regulations (CFR) 3100

40 CFR All Parts and Sections inclusive Protection of Environment, Revised as of October 1, 2001.

43 CFR, All Parts and Sections inclusive - Public Lands: Interior. Revised as of October 1, 2000.

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APPENDIX 1: TABLE1. EXISTING LEVEL OF DEVELOPMENT ON LEASE PARCEL

Lease Parcel Number NM201210	Acres (per GIS)	ACEC, SDA, Etc.	Allotment	Chapter	VRM Class	# Active Wells	Miles of Road (approx.)	Watershed Sub Basin	Stipulations/Comments
028	1189.01	N/A	Running Water & Hatch Spring	N/A	4	0	1.3	Rio Puerco	NM-11-LN Special Cultural Resource F-41-LN Biological Survey F-8-VRM Class IV F-4-TLS Seasonal Wildlife Habitat
029	1352.88	N/A	Badland Hills & Jicarilla	N/A	4	0	0.4	Rio Puerco	NM-11-LN Special Cultural Resource F-41-LN Biological Survey F-8-VRM Class IV F-4-TLS Seasonal Wildlife Habitat
030	300.00	N/A	Running Water, Arroyo, & Salado Creek	N/A	4	0	0.3	Rio Puerco	NM-11-LN Special Cultural Resource F-41-LN Biological Survey F-8-VRM Class IV F-4-TLS Seasonal Wildlife Habitat
031	533.89	N/A	Madera, Santos Ninos, & Black Bear	N/A	4	0	0.6	Rio Puerco	NM-11-LN Special Cultural Resource F-41-LN Biological Survey F-8-VRM Class IV F-4-TLS Seasonal Wildlife Habitat
032	213.90	N/A	N/A	N/A	N/A	0	0	Rio Puerco	NM-11-LN Special Cultural Resource F-41-LN Biological Survey F-4-TLS Seasonal Wildlife Habitat
033	40.00	N/A	N/A	N/A	N/A	0	0.3	Largo	NM-11-LN Special Cultural Resource F-41-LN Biological Survey F-4-TLS Seasonal Wildlife Habitat
034	40.00	N/A	N/A	N/A	N/A	0	0	Largo	NM-11-LN Special Cultural Resource F-41-LN Biological Survey F-4-TLS Seasonal Wildlife Habitat
035	321.52	N/A	N/A	N/A	N/A	0	0.5	Largo	Additional time need to evaluate issues raised by the private surface owner in comments and protest of April 2012 Oil & Gas Lease Sale.

036	80.00	N/A	Rancho Largo	Counselor	3	0	0.3	Largo	NM-11-LN Special Cultural Resource F-41-LN Biological Survey F-7-VRM Class III
037	80.00	N/A	Rancho Largo	Counselor	3	0	0.4	Largo	NM-11-LN Special Cultural Resource F-41-LN Biological Survey F-7-VRM Class III
038	80.00	N/A	Rancho Largo	Counselor	3	0	0	Largo	NM-11-LN Special Cultural Resource F-41-LN Biological Survey F-7-VRM Class III
039	637.40	N/A	N/A	Whitehorse Lake	N/A	0	3.5	Chaco	Parcel is in close proximity to Chaco Canyon National Historic Park. Defer for additional consultation.
040	120.06	East La Plata	Coyote Hill	N/A	3	0	0.7	La Plata	Closed to Leasing
041	160.00	Thomas Canyon	N/A	N/A	N/A	0	0.5	La Plata	Closed to Leasing
042	40.00	Thomas Canyon	Jones Canyon	N/A	3	0	0.7	La Plata	Closed to Leasing
043	80.00	Thomas Canyon	Coalbank Canyon	N/A	2	0	0.6	La Plata	Closed to Leasing
044	320.00	Hogback	Waterflow Community	N/A	2	0	1.1	Middle San Juan	Closed to Leasing
045	640.00	N/A	N/A	N/A	N/A	0	1.5	Middle San Juan	2nd Tribal Consultation
046	159.82	N/A	Badland Hills	N/A	4	0	0.7	Rio Puerco	NM-11-LN Special Cultural Resource F-41-LN Biological Survey F-8-VRM Class IV F-4-TLS Seasonal Wildlife Habitat

**Appendix 2: Draft Parcel List Received from New Mexico State Office for
October 17, 2012 Oil and Gas Lease Sale.**

NEW MEXICO PUBLIC DOMAIN-NW

NM-201210-028 1189.010 Acres

T.0220N, R.0010W, NM PM, NM

Sec. 004 LOTS 3,4;

004 S2NW,N2SE,S2S2SW;

004 N2NESW,N2SWNESW,SESWNESW;

004 S2SENESEW,N2N2NWSW;

004 SENENWSW,NESENWSW,NESESEW;

004 NENWSESEW;

005 N2N2N2SE,S2NWNWSE,SWNWSE;

005 NWSWSE,S2S2SE;

009 S2NE,NW,SESW,SE;

016 N2;

Sandoval County

Farmington FO

NMNM 101982, NMNM 101986

Formerly Lease No.

[Release for Sale](#)

NM-201210-029 1352.880 Acres

T.0220N, R.0010W, NM PM, NM

Sec. 005 LOTS 4;

005 SWNW,W2SW;

006 LOTS 1-7;

006 S2NE,SENE,E2SW,SE;

007 W2NE,NENW;

007 N2NESW,N2S2NESW,SESENESEW;

007 N2N2NESE,NENWSE,W2NWSE;

007 N2SENESE,SWSENESE;

007 N2NWSWSE,SWSWSESE;

007 E2SWSESE,SESESE;

008 NE,E2NW,NWNWNWSW;

008 E2W2NWSW,E2NWSW,N2SE;

Sandoval County

Farmington FO

NMNM 101982, NMNM 101984, NMNM 101986

Formerly Lease No.

Stipulations:

[Release for Sale](#)

NM-201210-030 300.000 Acres
T.0220N, R.0010W, NM PM, NM
Sec. 017 E2NE,NWNE,NENW;
017 N2NESW,N2SWNESW,SENESE;
017 S2NWSWSW,S2SWSW,N2SESE;
017 SWSESE,N2SESESE;
020 SWNENE,W2NESENE,W2SENE;
020 SESENE;

Sandoval County
Farmington FO
NMNM 101987, NMNM 101988
Formerly Lease No.
Stipulations:

[Release for Sale](#)

NM-201210-031 533.890 Acres
T.0220N, R.0010W, NM PM, NM
Sec. 021 LOTS 1-2;
021 N2SE;
028 LOTS 1-3;
028 S2NW;
029 LOTS 2-3;
029 SENE,N2NW,W2SW;

Sandoval County
Farmington FO
NMNM 56295, NMNM 61898, NMNM 84658
NMNM 92137, NMNM 92138
Formerly Lease No.
Stipulations:

[Release for Sale](#)

NM-201210-032 213.900 Acres
T.0220N, R.0010W, NM PM, NM
Sec. 033 LOTS 5-6;
033 SESW,W2SE,SESE;

Sandoval County
Farmington FO
NMNM 92137
Formerly Lease No.
Stipulations:

[Release for Sale](#)

NM-201210-033 40.000 Acres
T.0230N, R.0010W, NM PM, NM
Sec. 018 NESE;
Rio Arriba County
Farmington FO
NMNM 70296
Formerly Lease No.
Stipulations:
[Release for Sale](#)

NM-201210-034 40.000 Acres
T.0230N, R.0010W, NM PM, NM
Sec. 019 NENE;
Sandoval County
Farmington FO
NMNM 28694
Formerly Lease No.
Stipulations::
[Release for Sale](#)

NM-201210-035 321.520 Acres
T.0250N, R.0020W, NM PM, NM
Sec. 002 LOTS 1-4;
002 S2N2;
Rio Arriba County
Farmington FO
2ND REVIEW (4/12 SALE) GOLD PROTEST
NMNM 40646
Formerly Lease No.
Stipulations:
[Defer-Additional time needed to evaluate private surface owner concerns.](#)

NM-201210-036 80.000 Acres
T.0240N, R.0060W, NM PM, NM
Sec. 029 N2NE;
Rio Arriba County
Farmington FO
3RD REVIEW
NMSF 079428
Formerly Lease No.
Stipulations:
[Release for Sale](#)

NM-201210-037 80.000 Acres
T.0240N, R.0060W, NM PM, NM
Sec. 029 E2SE;
Rio Arriba County
Farmington FO
3RD REVIEW
NMNMSF 079428
Formerly Lease No.
Stipulations:
[Release for Sale](#)

NM-201210-038 80.000 Acres
T.0240N, R.0060W, NM PM, NM
Sec. 029 S2NW;
Rio Arriba County
Farmington FO
3RD REVIEW
NMSF 079428
Formerly Lease No.
Stipulations:
[Release for Sale](#)

NM-201210-039 637.400 Acres
T.0200N, R.0090W, NM PM, NM
Sec. 030 LOTS 1-4;
030 E2,E2W2;
McKinley County
Farmington FO
4TH REVIEW
NMNM 118135
Formerly Lease No.
Stipulations:
[Defer-Tribal and Chaco Park Consultation](#)

NM-201210-040 120.060 Acres
T.0320N, R.0130W, NM PM, NM
Sec. 011 LOTS 5,6;
011 S2SE;
San Juan County
Farmington FO
2ND REVIEW
NMNM 101060
Formerly Lease No.
Stipulations:
[Closed to Leasing](#)

NM-201210-041 160.000 Acres
T.0320N, R.0130W, NM PM, NM
Sec. 020 S2S2;
San Juan County
Farmington FO
2ND REVIEW
NMNM 101061
Formerly Lease No.
Stipulations:
Closed to Leasing

NM-201210-042 40.000 Acres
T.0320N, R.0130W, NM PM, NM
Sec. 021 SESE;
San Juan County
Farmington FO
2ND REVIEW
NMNM 101061
Formerly Lease No.
Stipulations:
Closed to Leasing

NM-201210-043 80.000 Acres
T.0320N, R.0130W, NM PM, NM
Sec. 032 W2SE;
San Juan County
Farmington FO
2ND REVIEW
NMNM 101061
Formerly Lease No.
Stipulations:
Closed to Leasing

NM-201210-044 320.000 Acres
T.0300N, R.0160W, NM PM, NM
Sec. 023 W2NE,SENE;
024 N2N2SESW,N2N2SWSE;
024 S2SWNE,S2NW,NESW,NWSE;
San Juan County
Farmington FO
2ND REVIEW
NMNM 39911, NMNM 81642, NMNM81855
NMNM 81856
Formerly Lease No.
Stipulations:
Closed to Leasing

NM-201210-045 640.000 Acres
T.0300N, R.0160W, NM PM, NM
Sec. 026 SWSW;
027 NWSE,S2SE;
034 E2;
035 W2W2;
San Juan County
Farmington FO
2ND REVIEW
NMNM 100311, NMNM 100312, NMNM 100313
Formerly Lease No.
Stipulations:
[Defer-Tribal Consultation](#)

NM-201210-046 159.820 Acres
T.0220N, R.0010W, NM PM, NM
Sec. 005 LOTS 3;
005 SENW,E2SW;
Sandoval County
Farmington FO
NMNM 101983
Formerly Lease No.
Stipulations:
[Release for Sale](#)