DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ROSWELL FIELD OFFICE

Project: October 2011 Competitive Oil and Gas Lease Sale
EA Log Number: DOI-BLM-NM-P010-2011-138-EA
Location: Locations in Chaves County, New Mexico.

Finding of No Significant Impact

Based on the analysis of potential environmental impacts contained in the attached environmental assessment, I have determined the Preferred Alternative (Alternative C) is not expected to have significant impacts on the environment. The impacts of leasing fluid minerals estate in the areas described with this EA have been previously analyzed in the 1997 Roswell RMP and the 2008 Special Status Species RMPA; 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:

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BUREAU OF LAND MANAGEMENT
ROSWELL FIELD OFFICE

ENVIRONMENTAL ASSESSMENT FOR OCTOBER 2011 COMPETITIVE OIL AND GAS LEASE SALE DOI-BLM-NM-P010-2011-138-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 parcels in New Mexico, Oklahoma, Texas, and Kansas. A Notice of Competitive Lease Sale (NCLS), which lists lease parcels to be offered at the auction, is published by the BLM NMSO at least 90 days before the auction is held. Lease stipulations applicable to each parcel 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 BLM NMSO sends a draft parcel list to any Field Offices in which parcels are located. Field office staff then review the legal descriptions of the parcels 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 1997 Roswell Resource Management Plan (RMP) and subsequent amendments, were posted online for a two week public scoping period. No comments were received.

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

This EA documents the Roswell Field Office (RFO) review of the One (1) parcels nominated for the October 2011 Competitive Oil and Gas Lease Sale that are under the administration of the RFO. It serves to verify conformance with the approved land use plan, provides the rationale for deferring or dropping parcels from a lease sale, as well as providing rationale for attaching additional lease stipulations to specific parcels.

This EA was made available for public review and comment for 30 days. No comments were received.

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 parcels 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 1997 Roswell RMP. The RMP designated approximately 7.84 million acres of federal minerals open for continued oil and gas development and leasing under Standard Terms and Conditions. The RMP, along with the 2008 Special Status Species RMP Amendment (RMPA), also describe specific stipulations that would be attached to new leases offered in certain areas. Therefore, it is determined that the action alternatives conform to fluid mineral leasing decisions in the 1997 Roswell RMP and subsequent amendment and are consistent with the goals and objectives for natural and cultural resources. The Federal Land Policy and Management Act of 1976 (FLPMA) established guidelines to provide for the management, protection, development, and enhancement of public lands (Public Law 94-579).

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 1997 Roswell 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 1997 Roswell RMP and the 2008 Special Status Species RMPA. 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.

Roswell 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. #2-22-96-F-102, Cons. #22420-2006-I-0144, and Cons. #22420-2007-TA-0033. No further consultation with the U.S. Fish and Wildlife Service (USFWS) is required at this stage.

In April 2008, the BLM Pecos District Special Status Species RMPA amended the Roswell RMP in portions of the RFO with references to the Planning Area, as described in that document, to ensure continued habitat protection of two special status species, the lesser prairie-chicken (*Tympanuchus pallidicinctus*) (LPC) and the sand dune lizard (*Sceloporus arenicolus*) (SDL). This action is in compliance with threatened and endangered species management outlined in the September 2006 (Cons. #22420-2007-TA-0033) Biological Assessments and in accordance with the requirements of the FLMPA and NEPA.

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 RFO, 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 parcels are withheld from the sale while letters requesting information, comments, or concerns are sent to the Native American representative. If the same draft parcels appear in a future sale, a second request for information is sent to the same recipients and the parcels will be held back again. If no response to the second letter is received, the parcels are allowed to be offered in the next 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. Native American consultation letters were sent out for the July 2011 Lease Sale.

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 New Mexico State BLM 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, 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 would remain on the lease sale; however, the BLM would resolve any protest prior to issuing an oil and gas lease for that parcel. If the protest is upheld, the BLM would return the payments received from the successful bidder for that parcel. 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 of the RFO resource specialists on April 20, 2011 to identify and consider potentially affected resources and associated issues. The USFWS and NM State Game & Fish Department were also invited to attend but failed to appear. During the meeting, the interdisciplinary team developed the Preferred Alternative, presented in section 2.3 below, to address the unresolved conflicts related to the Proposed Action.

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 25, 2011 through May 9, 2011.

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

Wildlife

What would be the effects of the alternatives on lesser prairie-chicken lekking and reproduction?

What would be the effects of the alternatives on Sand Dune Lizard Habitat and their distribution?

Range

What would be the effects of the alternatives have on current grazing aums?

What would be the effects of the alternatives have on vegetation structure?

Hydrology

What would be the effects of the alternatives on ground water and surface water?

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 elements are determined by an interdisciplinary team of resource specialists, following their onsite visit and review of the RMP and other data sources, to not be present: Areas of Critical Environmental Concern, Prime or Unique Farmlands, Floodplains, Wild and Scenic Rivers, Threatened and Endangered Species, Wetlands/Riparian Zones, Wilderness or Wilderness Study Areas, 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 proposed 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 one (1) parcel would not be offered for lease during the October 2011 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 a future lease sale.

2.2 Alternative B – Proposed Action

The Proposed Action is to lease the one (1) parcel of federal minerals nominated by the public, covering 400.00 acres administered by the RFO, for oil and gas exploration and development. Standard terms and conditions as well as stipulations listed in the RMP and RMPAs would apply. A complete description of these parcels, including any stipulations, is provided in Appendix 1.

The parcel contains a special Cultural Resources Lease Notice stating that all development activities proposed under the authority of these leases are subject to compliances with Section 106 of the NHPA and Executive Order (EO) 13007.

Once sold, the lease purchaser has the right to use so much of the leased lands as is necessary to explore and drill for oil and gas within the lease boundaries, subject to the stipulations attached to the lease (43 CFR 3101). 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 lease holder 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, ownership of the minerals leased revert back to the federal government and the lease can be resold.

Drilling of wells on a lease would not be permitted until the lease owner or operator meets the site specific requirements specified in 43 CFR 3162.

2.3 Alternative C - Preferred Alternative

The Preferred Alternative is to lease for oil and gas lease one (1) nominated parcel of federal minerals, covering 400 acres administered by the RFO. In addition to applying the standard terms and conditions, as well as stipulations listed in the RMP and RMPAs to each of these parcels, this preferred alternative also contains a new lease notice for offsite mitigation.

The Preferred Alternative was developed during an internal review conducted by the RFO interdisciplinary staff on April 20, 2011. During that meeting it was determined that Parcel number 008 would be leased for sale. Location, stipulation, and acreage for the one (1) parcel is listed in Table 2-1 below. Standard terms and conditions as well as stipulations would apply. Lease stipulations (as required by Title 43 CFR 3101.1-3) would be added to the 1 parcel to address site specific concerns. During the review it was also determined that lands within the parcel had been recently restored with public and/or partnership funds in attempt to improve the health and viability of the land or resources. To ensure potential impacts to this investment and/or other sensitive resources are mitigated, a new off-site mitigation lease notice was developed, consistent with national oil and gas policy (BLM Washington Office Instruction Memorandum 2008-204), to inform the lessee of the potential modifications including off-site mitigation that may be requested at the time of the site specific development proposal. The following is the new lease notice presented in full:

> OFF-SITE MITIGATION LEASE NOTICE
> All or a portion of this lease may encompass resources of concern such as, but not limited to,
>
> - plants, animals, and/or their habitats determined to be threatened, endangered or of special concern (i.e., state sensitive species, state species of management concern)
> - lands that have been restored with public (Federal) and/or partnership funds to improve the health and viability of the land or resources
> - other sensitive resource values such as, but not limited to, paleontological resources, wetlands, riparian systems, aquatic resources, fragile soils, and cave and karst environments

The BLM may recommend modifications to exploration and development proposals to mitigate the above values that would be disturbed by development of the lease or to further its conservation and management objective to avoid BLM approved activity that will contribute to a need to list such a species or their habitat. In the case where onsite mitigation alone may not be possible or sufficient, offsite mitigation measures may be utilized. Offsite mitigation may include, but is not limited to, the following:

- In-kind: Replacement or substitution of resources that are of the same type and kind as those being impacted.

  Example: For every acre of new, long-term surface disturbance in important lesser prairie-chicken nesting/early brood-rearing habitat in Area (A), (x) acres of unsuitable habitat in Area (B) is reclaimed, treated, or planted to create new or suitable nesting/early brood-rearing sage-grouse habitat.

- Out-of-kind: Replacement or substitute resources that, while related, are of equal or greater overall value to public lands.

  Example: For every acre of new, long-term surface disturbance in important lesser prairie-chicken nesting/early brood-rearing habitat in Area (A), the project proponent agrees to bury (x) miles of existing power lines and remove the power poles used as hunting perches by raptors in Area (B).

- In-lieu-fee: Payment of funds to the BLM or a natural resource management agency, foundation, or other appropriate organization for performance of mitigation that addresses impacts of a project (Federal Land Policy Management Act section 307(c)).

  Example: The applicant may make payment to the BLM or a conservation group based on the amount of acres that will be disturbed in exchange for commitment from the recipient to apply the funds toward local lesser prairie-chicken core habitat protection/restoration projects.

Once sold, the lease purchaser has the right to use so 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; ownership of the minerals leased revert back to the federal government and the lease can be resold. 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 one (1) parcel contains a special 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. Standard terms and conditions, stipulations listed in the RMP, and any new stipulations would apply as appropriate to each lease. 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.

Parcel recommended for leasing under the Preferred Alternative with stipulations are presented below in Table 2-1:

Table 2-1 Alternative C: Preferred Alternative Parcels

Parcel	Stipulations	Acres
NM-201110-008 T.0150S, R.0290E, NM PM, NM Sec. 023 E2SE; 026 E2; Chaves County Roswell FO	Lease with the following Stipulations: NM-11-LN – Special Cultural Resource SENM-S-22 Prairie Chickens SENM-LN-5 Offsite Mitigation	400

Standard terms and conditions as well as stipulations developed through the parcel review and analysis process would apply as additional lease stipulations (as required by Title 43 CFR 3101.3) to address site specific concerns or new information not identified in the land use planning process.

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. Only those elements of the affected environment that have potential to be significantly impacted are described in detail.

3.1. Air Quality

The Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality, including seven nationally regulated ambient air pollutants. These criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM10 & PM2.5), sulfur dioxide (SO_2) and lead (Pb). Regulation of air quality is delegated to the State of New Mexico. Air quality is determined by atmospheric pollutants and chemistry, dispersion meteorology and terrain, and includes applications of noise, smoke management, and visibility. The area of the analysis is considered a Class II air quality area. A Class II area allows moderate amounts of air quality degradation. The primary sources of air pollution are dust from blowing wind on disturbed or exposed soil and exhaust emissions from motorized equipment.

Air quality in the areas of the proposed lease tracts is generally good as defined by the Air Quality Index. None of the potential lease tracts are located in any of the areas designated by the EPA as "non-attainment areas" for any listed pollutants regulated by the Clean Air Act.

Additional general information on air quality in these areas is contained in Chapter 3 of the Roswell Draft RMP/Environmental Impact Statement.

3.2 Climate

The planning area is located in an arid to semiarid continental climate regime typified by mild winters, windy conditions, limited rainfall, and hot summers (1994 Roswell Draft RMP EIS). Table 3.3 summarizes components of climate that could affect air quality in the region.

Climate Component	**Temperature**
Mean maximum summer temperatures	92°F
Mean minimum winter temperatures	28°F
Mean annual temperature	62°F
Mean annual precipitation	12.5 inches
Mean annual snowfall	8.6 inches
Mean annual wind speed	12 mile per hour (mph)
Prevailing wind direction	West

In addition to the air quality information in the RMPs cited above, new information about greenhouse gases (GHGs) and their effects on national and global climate conditions has emerged since the RMPs were prepared. Global mean surface temperatures have increased nearly 1.0°C (1.8°F) from 1890 to 2006 (Goddard Institute for Space Studies, 2007). However, observations and predictive models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Without additional meteorological monitoring and modeling systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions; what is known is that increasing concentrations of GHGs are likely to accelerate the rate of climate change.

Greenhouse gases that are included in the US Greenhouse Gas Inventory are: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). CO_2 and methane (CH_4) are typically emitted from combustion activities or are directly emitted into the atmosphere. On-going scientific research has identified the potential impacts of greenhouse gas emissions (including CO_2; CH_4; nitrous oxide (N_2O), water vapor; and several trace gasses) on global climate. Through complex interactions on regional and global scales, these greenhouse gas emissions cause a net warming effect of the atmosphere (which making makes surface temperatures suitable for life on Earth), primarily by decreasing the amount of heat energy radiated by the Earth back into space. Although greenhouse gas levels have varied for millennia (along with corresponding variations in climatic conditions), recent industrialization and burning of fossil carbon sources have caused CO_2 concentrations to increase dramatically, and are likely to contribute to overall climatic changes, typically referred to as global warming. Increasing CO_2 concentrations also lead to preferential fertilization and growth of specific plant species.

In 2007, the Intergovernmental Panel on Climate Change (IPCC) predicted that by the year 2100, global average surface temperatures would increase 1.4 to 5.8°C (2.5 to 10.4°F) above 1990 levels. The National Academy of Sciences (2006) supports these predictions, but has acknowledged that there are uncertainties regarding how climate change may affect different regions. Computer model predictions indicate that increases in temperature will not be equally distributed, but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be greater than during the summer, and increases in daily minimum temperatures is more likely than increases in daily maximum temperatures. It is not, however, possible at this time to predict with any certainty the causal connection of site specific emissions from sources to impacts on the global/regional climate relative to the Preferred Alternative and subsequent actions of oil and gas development.

Mean annual temperatures have risen across New Mexico and the southwestern U.S. since the early 20th century. When compared to baseline information, periods between 1991 and 2005 show temperature increases in over 95% of the geographical area of New Mexico. Warming is greatest in the northwestern, central, and southwestern parts of the state. Recurrent research has indicated that predicting the future effects of climate change and subsequent challenges of managing resources in the Southwest is not feasible at this time (USFS, 2008). However, it has been noted that forests at higher elevations in New Mexico, for example, have been exposed to warmer and drier conditions over a ten year period. Should the trend continue, the habitats and identified drought sensitive species in these forested areas and higher elevations may also be affected by climate change (Enquist and Gori).

A number of activities contribute to the phenomenon of climate change, including emissions of GHGs (especially carbon dioxide and methane) from fossil fuel development, large wildfires, activities using combustion engines, changes to the natural carbon cycle, and changes to radiative forces and reflectivity (albedo). It is important to note that GHGs will have a sustained climatic impact over different temporal scales due to their differences in global warming potential (described above) and lifespans in the atmosphere.

3.3 Heritage Resources

3.3.1 Cultural Resources

Once the decision is made by the lessee to develop a lease, area specific cultural records review would be done to determine if there is a need for a cultural inventory of the areas that could be affected by the subsequent 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 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 project falls within the Southeastern New Mexico Archaeological Region. This region contains the following cultural/temporal periods: Paleoindian (ca. 12,000-8,000 B.C.), Archaic (ca. 8000 B.C. –A.D. 950), Ceramic (ca. A.D. 600-1540) Protohistoric and Spanish Colonial (ca. A.D. 1400-1821), and Mexican and American Historical (ca. A.D. 1822 to early 20th century). Sites representing any or all of these periods are known to occur within the region. A more

complete discussion can be found in *Living on the Land: 11,000 Years of Human Adaptation in Southeastern New Mexico An Overview of Cultural Resources in the Roswell District, Bureau of Land Management* published in 1989 by the U.S. Department of the Interior, Bureau of Land Management. A cultural resource inventory shall be conducted of the area of effect for the proposed project prior to any ground disturbing activities.

When a lessee proposes to explore or develop its lease, an area-specific cultural records review would be done, in accordance with Section 106, 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 Section 106 cultural inventory will be required and all historic and archeological sites that are eligible for listing in the National Register of Historic Places 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.

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.

A review of existing information indicates the proposed actions are outside any known Traditional Cultural Property.

3.3.3 Paleontological Resources

Parcels in this lease sale may contain vertebrate fossils and the same cultural reviews would apply for the Paleontology Resources.

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). A Class 2 designation is the highest rank given to a parcel for this oil and gas lease sale.

3.4 Water Resources

3.4.2 Water Quality – Surface/Ground

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, recreational use and brush control treatments. No perennial surface water is found on public land in the proposed lease areas. Intermittent streams and rivers are located within the area of the proposed lease sale. Ephemeral surface water within the area may be located in tributaries, playas, alkali lakes and stock tanks.

The surface is covered by Quaternary alluviums of sand, silt, clay and some gravel. Some of the Quaternary Alluviums are thin deposits of windblown sand and silt. Some groundwater is obtained from the Triassic aged sandstones found in the Chinle and Santa Rosa formations both of which contribute to the supply of domestic and stock water. Groundwater is generally fair to saline. In areas sulfate is high but generally satisfactory for stock and irrigation. Groundwater in the vicinity of the northern parcel occurs in the 600 to 700 ft range of the Yeso formation. All other groundwater occurs in an approximate range of 50 to 500 + ft., primarily in the Chinle formation.

3.4.3 Watershed - Hydrology

The proposed lease parcels fall within two 8-digit hydrologic unit code watersheds. Lease parcel NM-201110-008 is located within the 13060011 8-digit hydrologic unit code. 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 livestock grazing management, recreational use activities, groundwater pumping and also oil and gas developments such as well pads, permanent roads, temporary roads, pipelines, and powerlines.

3.5 Soil

The Soil Conservation Service, now the Natural Resource Conservation Service (NRCS), has surveyed the soils in Chaves County. Complete soil information is available in the Soil Survey of Chaves County, New Mexico, Southern Part (USDA Soil Conservation Service 1980. The soil map units represented in the project area are:

Parcel	Soils
NM-201110-008 T.0150S, R.0290E, NM PM, NM Sec. 023 E2SE; 026 E2; Chaves County Roswell FO	Berino-Cacique association, 0 to 3 percent slopes (BE) Runoff of the Berino soil is very slow and the hazard of water erosion is slight and the hazard of soil blowing is moderate. Runoff of the Cacique soil is slow and the hazard of water erosion is slight and the hazard of soil blowing is moderate.

3.6 Vegetation

The parcels indicate portions of the following Plant Communities; Grassland and the Shinnery-Oak Dune Communities with Ecological Sites- Sandy SD-3, Gravelly SD-3, Sandy HP-3 and Loamy HP-3 all falling in the Grassland Community; Deep Sand SD-3 is considered to be in the Shinnery Oak Dune Community.

GRASSLAND

Lease parcels are within the grassland community as identified in the Roswell Resource Management Plan/Environmental Impact Statement (RMP/EIS). Appendix 11 of the RMP/EIS describes the Desired Plant Community (DPC) concept and identifies the components of each community. The Primary consideration in listing range sites under this community type is influenced by loamy upland soils and nearly level to undulating plains. The plant community is dominated by warm-season short and mid-grasses.

The grassland community type is widespread and mostly encompasses areas in the northern half of the resource area. Slopes range from 0-9 percent, and the average elevation is 3500 to 5000 feet above sea level.

The majority of this community type is dominated by blue grama, tobosa, black grama, sideoats grama, sand dropseed, ring muhly, threeawn, bluestem species and vine mesquite; while alkali sacaton dominates the bottomland areas. Forb species fluctuate from year to year dependent upon rainfall but can include such species as globemallow, wild buchwheat, annual sunflower, and astragalus species. Shrubs make up a minor component of grassland communities but include broom snakeweed, yucca, prickly pear cactus, winterfat and mesquite.

SHINNERY-OAK DUNE

Lease parcels are within the shinnery-oak dune vegetative community as identified in the Roswell Resource Management Plan/Environmental Impact Statement (RMP/EIS). Appendix 11 of the RMP/EIS describes the Desired Plant Community (DPC) concept and identifies the components of each community. The primary features in the shinnery oak dune (SOD) community are topography influenced by aeolian and alluvial sedimentation on upland plains forming hummocks, dunes, sand ridges and swales and the presence of shinnery oak *(Quercus havardii).* The topography is gently sloping and undulating sandy plains, with moderate to very steep hummocky dunes of up to ten feet and more in height scattered throughout the area. Some of the dunes are stabilized with vegetation, while a number of them are unstable and shifting. Dune blowouts with shinnery oak and bluestem, either isolated or in dune complexes are common in this community. Dominant grasses include sand bluestem *(Andropogon hallii),* little bluestem *(Schizachiyrium scoparium),* and three-awn *(Aristida* spp.).

3. 7 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 Non native 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.

Noxious weeds, primarily African rue and Malta star thistle, were determined to exist and are scattered within the area. Small infestations of noxious weeds are located within or immediately adjacent to the project area. Project activities, even with preventative management actions, could result in the establishment and spread of noxious weeds on disturbed sites throughout portions of the project area. Most of the noxious weeds exist mainly along the shoulders of County roads, lease and private roads, and on production pads within the project area

3.8 Special Status Species

3.8.1 Threatened or Endangered Species

Under Section 7 of the ESA, the BLM is required to consult with the USFWS on any proposed action which may affect Federal listed threatened or endangered species or species proposed for listing. There are no known threatened or endangered species located within the area of analysis.

3.8.2 Other Special Status Species

In accordance with BLM Manual 6840, 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. Included in this category are State listed endangered species and Federal candidate species which receive no special protections under the Endangered Species Act. Special status species with potential to occur in the proposed project area are listed in Table 3.19.1.

Table 3.19.1 Habitat Descriptions and Presence of BLM Roswell Field Office Special Status Species.

Common Name (scientific name)	Status	Habitat	Presence*
Lesser prairie chicken (*Tympanuchus pallidicinctus*)	Candidate	Shinnery Oak Dune	**S**
Sand Dune Lizard (*Sceloporus arenicolus*)	Candidate	Shinnery Oak Dune	**S**

Presence***S** - Habitat suitable and species suspected to occur within the project area.

<u>Lesser Prairie-Chicken</u>

Sand shinnery communities extend across the southern Great Plains occupying sandy soils in portions of north and western Texas, western Oklahoma, and southeast New Mexico. Portions of Eddy, Lea and Chaves counties consist largely of sand shinnery habitat and are intermixed with

areas of mesquite to a lesser degree. The characteristic feature of these communities is co-dominance by shinnery oak and various species of grasses. In New Mexico Shinnery oak occurs in sandy soil areas, often including sand dunes.

In New Mexico, the lesser prairie-chicken (LPC) formerly occupied a range that encompassed the easternmost one-third of the state, extending to the Pecos River, and 48 km west of the Pecos near Fort Sumner. This covered about 38,000 km^2. By the beginning of the 20th Century, populations still existed in nine eastern counties (Union, Harding, Chaves, De Baca, Quay, Curry, Roosevelt, Lea, and Eddy). The last reliable records from Union County are from 1993. Currently, populations exist only in parts of Lea, Eddy, Curry, Chaves, and Roosevelt counties, comprising about 23% of the historical range.

LPC are found throughout dry grasslands that contained shinnery oak or sand sage. Currently, they most commonly are found in sandy-soiled, mixed-grass vegetation, sometimes with short-grass habitats with clayey or loamy soils interspersed. They occasionally are found in farmland and smaller fields, especially in winter. Shinnery oak shoots are used as cover and produce acorns, which are important food for LPC and many other species of birds, such as the scaled quail, northern bobwhite, and mourning dove. Current geographic range of shinnery oak is nearly congruent with that of the lesser prairie-chicken, and these species sometimes are considered ecological partners. Population densities of LPC are greater in shinnery oak habitat than in sand sage habitat.

LPC use a breeding system in which males form display groups. These groups perform mating displays on arenas called leks. During mating displays male vocalizations called booming, attract females to the lek. Leks are often on knolls, ridges, or other raised areas, but in New Mexico leks are just as likely to be on flat areas such as roads, abandoned oil drill pads, dry playa lakes or at the center of wide, shallow depressions. Leks may be completely bare, covered with short grass, or have scattered clumps of grass or short tufts of plants. An important physical requirement for location of leks is visibility of surroundings, but the most important consideration is proximity of suitable nesting habitat, breeding females and the ability to hear male vocalizations.

In June 1998, the US Fish and Wildlife Service (USFWS) issued a statement regarding their status review of the lesser prairie-chicken. It stated, “Protection of the lesser prairie-chicken under the Federal Endangered Species Act (ESA) is warranted but precluded which means that other species in greater need of protection must take priority in the listing process.” Given the current Federal Candidate status of this species, the BLM is mandated to carry out management consistent with the principles of multiple use, for the conservation of candidate species and their habitats, and shall ensure that actions authorized, funded, or carried out do not contribute to the need to list any of these species as Threatened or Endangered (Bureau Manual 6840.06).

Sand Dune Lizard

The sand dune lizard is a species with a limited geographic range including parts of Chaves, Eddy, Lea and Roosevelt Counties of southeastern New Mexico and 4 counties in Texas. The sand dune lizard is a habitat specialist, found exclusively in association with Shinnery oak (*Quercus havardii*) dune complexes. The lizard prefers large deep blowouts associated with the shinnery oak habitat.

The Center for Biological Diversity and Chihuahuan Desert Conservation Alliance petitioned the U.S. Fish and Wildlife Service on May 28, 2002 to list the sand dune lizard as an endangered species under the Endangered Species Act. In May 2005, the US Fish and Wildlife Service (USFWS) issued a statement regarding their status review of the sand dune lizard (SDL). It stated, "Protection of the sand dune lizard under the Federal Endangered Species Act (ESA) is warranted but precluded, which means that other species in greater need of protection must take priority in the listing process". Given the current Federal Candidate status of this species, the BLM is mandated to carry out management, consistent with the principles of multiple use, for the conservation of candidate species and their habitats and shall ensure that actions authorized, funded, or carried out do not contribute to the need to list any of these species as Threatened or Endangered (Bureau Manual 6840.06). On December 13, 2010, the USFWS published a proposal to list the sand dune lizard (Dune Sagebrush Lizard) as federally endangered under the Endangered Species Act of 1973.

It is not known at this time whether occupied dune complexes for SDL are associated with this specific location. However it is vitally important that the RFO take every precaution to ensure that occupied dune complexes are protected. Subsequently, only after survey efforts during the summer months are conducted, will it be known whether an active dune complex is in close proximity (within one hundred meters) of the proposed location or not.

3.9 Wildlife

The entire area provides a myriad of habitat types for terrestrial and aquatic wildlife species. The diversity and abundance of wildlife species in the area is due to the presence Grasslands, Shinnery Oak Dunes, Pecos River floodplain, a mixture of grassland habitat and mixed desert shrub vegetation, and escarpments which divides the uplands from the Pecos River valley.

Common bird species are mourning dove, mockingbird, white-crowned sparrow, black-throated sparrow, blue grosbeak, northern oriole, western meadowlark, Crissal thrasher, western kingbird, northern flicker, common nighthawk, loggerhead shrike, and roadrunner. Raptors include northern harrier, Swainson's hawk, American kestrel, and occasionally golden eagle and ferruginous hawk.

Common mammal species using the area include mule deer, pronghorn, coyote, gray fox, bobcat, striped skunk, porcupine, raccoon, badger, jackrabbit, cottontail, white-footed mouse, deer mouse, grasshopper mouse, kangaroo rat, spotted ground squirrel, and woodrat.

A variety of reptiles also occur in the area such as yellow mud turtle, box turtle, eastern fence lizard, side-blotched lizard, horned lizard, whiptail, hognose snake, coachwhip, gopher snake, rattlesnake, and spadefoot toad.

3.10 Livestock Grazing

The lease parcel NM-201107-008, is within the Turkey Track Allotment, specifically the North Pipeline pasture.

3.11 Visual Resources

The nominated lease parcels are located in an area designated VRM Class III and Class IV. Visual Resource Management (VRM) on public lands is conducted in accordance with BLM Handbook 8410 and BLM Manual 8411.

The Class III objective is to: Partially retain existing landscape character. The level of change to the characteristic landscape should 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 objective of Class IV is to: "Provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to reduce or eliminate activity impacts through careful location, minimal disturbance, and repeating the basic landscape elements."

3.12 Recreation

The lease areas are primarily used by recreational visitors engaged in hunting, caving, sightseeing, driving for pleasure, off-highway vehicle use, and other recreational activities. Non-recreation visitors include oil and gas industrial workers and ranchers.

3.13 Cave/Karst

No surface cave/karst features were observed in the immediate vicinity of the proposed actions. The proposed leases are located in Low Karst Potential Areas.

3.14 Minerals Resources

There are no unplugged wells within any of the parcels listed in this July 2011 Lease Sale or parcels in reference to this EA. Construction material (caliche/gravel) for developing the nominated parcels could be obtained by the operator from abandoned oil and gas pads and roads that currently exist on the nominated parcels, or from a federal pit identified by a BLM authorized officer. A permit will be required prior to removal of any Federal mineral material.

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 July 2011 Oil and Gas Lease Sale will not be out of conformance with this executive order.

Portions of the City of Dexter and the City of Hagerman consist of minorities with some low-income populations. However, none of the leases nominated fall within the city limits of either

city. Most of the populations that lie near these leases are with the agricultural or mining sector and do not fall under the coverage of this executive order.

ENVIRONMENTAL IMPACTS

4.0 Environmental Consequences

4.1 Assumptions for Analysis

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

If 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 these leases. Potential cumulative effects may occur should an oil and gas field be discovered if these parcels are drilled and other infield wells are drilled within these leases or if these leases become part of a new unit. All actions, not just oil and gas development may occur in the area, including foreseeable non-federal actions.

4.2 Effects from the No Action Alternative

Under the No Action Alternative, the proposed parcels 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 Quality Impacts from All Action Alternatives

Leasing the subject tracts would have no direct impacts to air quality. Any potential effects to air

quality from sale of lease parcels would occur at such time that the leases were developed. Potential impacts of development would include increased air borne soil particles blown from new well pads or roads, exhaust emissions from drilling equipment, compressor engines, vehicles, flares, and dehydration and separation facilities, and volatile organic compounds during drilling or production activities.

The reasonable and foreseeable development scenario developed for the Roswell RMP demonstrated 60 wells would be drilled annually for Federal minerals. However, it is unknown whether the petroleum resources specific to these leases in the Proposed Action are gas or oil or a combination thereof, as well as the actual potential for those resources. In addition, oil wells are on a tighter spacing than gas wells, therefore the specific number of wells that would be drilled as a result of issuing the leases is unknown. Current APD permitting trends within the field office also confirm that these assumptions are still accurate.

Therefore, in order to reasonably quantify emissions associated with well exploration and production activities, certain types of information are needed. Such information includes a combination of activity data such as the types of equipment needed if a well were to be completed successfully (e.g. compressor, separator, dehydrator), the technologies which may be employed by a given company for drilling any new wells, area of disturbance for each type of activity (e.g. roads, pads, electric lines, compressor station), number of days to complete each kind of construction, number of days for each phase of drilling process, type(s), size, number of heavy equipment used for each type of construction (backhoe, dozer, etc.), number of wells of all types (shallow, deep, exploratory, etc.), compression per well (sales, field booster), or average horsepower for each type of compressor. The degree of impact will also vary according to the characteristics of the geologic formations from which production occurs. Since this type of data is unavailable at this time, including scenarios for oil and gas development, it is unreasonable to quantify emissions. What can be said is that exploration and production would contribute to incremental increases in overall air quality emissions associated with oil and gas exploration and production into the atmosphere.

Coalbed methane does not exist within the field office and, therefore, there are no emissions from this source.

Potential Mitigation:
The BLM encourages industry to incorporate and implement 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 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.

4.3.2 Climate

The assessment of GHG emissions, their relationship to global climatic patterns, and the resulting impacts is an ongoing scientific process. It is currently not feasible to know with certainty the net impacts from the proposed action on climate—that is, while BLM actions may contribute to the climate change phenomenon, the specific effects of those actions on global climate are speculative given the current state of the science. The BLM does not have the ability to associate a BLM action's contribution to climate change with impacts in any particular area. The technology to be able to do so is not yet available. The inconsistency in results of scientific models used to predict climate change at the global scale coupled with the lack of scientific models designed to predict climate change on regional or local scales, limits the ability to quantify potential future impacts of decisions made at this level and determining the significance of any discrete amount of GHG emissions is beyond the limits of existing science. When further information on the impacts to climate change is known, such information would be incorporated into the BLM's planning and NEPA documents as appropriate.

Leasing the subject tracts would have no direct impacts on climate as a result of GHG emissions. There is an assumption, however, that leasing the parcels would lead to some type of development that would have indirect effects on global climate through GHG emissions. However, those effects on global climate change cannot be determined. (Refer to the cumulative effects section, Chapter 4 for additional information.) It is unknown whether the petroleum resources specific to these leases in the Proposed Action are gas or oil or a combination thereof.

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 3 for the US, New Mexico and for wells on federal leases in each basin.

Table 3: 2008 Oil and Gas Production

Location	Oil (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

In order to estimate the contribution of Federal oil and gas leases to greenhouse gases in New Mexico it is assumed that the percentage of total U.S. production is comparable to the percentage of total emissions. Therefore, emissions are estimated based on production starting with total emissions for the United States from EPA 2010, and applying production percentages to estimate emissions for the Permian Basin. It is understood that this is a rather simplistic technique and assumes similar emissions in basins that may have very different characteristics and operational procedures, which could be reflected in total emissions. This assumption is adequate for this level of analysis due to the unknown factors associated with eventual exploration and development of the leases. However, the emissions estimates derived in this way, while not

precise will give some insight into the order of magnitude of emissions from federal oil and gas leases administered by the Bureau of Land Management (BLM) and allow for comparison with other sources in a broad sense.

Table 4: 2008 Oil and Gas Field Production Potential Emissions

Location	Oil		Gas		Total O&G Production	%U.S. Total GHG emissions
	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 4 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 phase 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 CO_2e have been used in Table 4 to avoid very small numbers. CO_2e is the concentration of CO_2 that would cause the same level of radiative forcing as a given type and concentration of greenhouse gas. For comparison one million metric tons is equal to one teragram.

Table 4 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 CO_2e from the life cycle of oil and gas. For example, acquisition (drilling and development) for petroleum is responsible for only 8% of the total CO_2e 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 estimate the potential emissions from the proposed lease sale, an estimate of emission per well is useful. To establish the exact number of Federal wells in the Permian Basin is problematic due to the ongoing development of new wells, the abandonment of unproductive wells, land sales and exchanges, and incomplete or inaccurate data bases. RFO determined that the most transparent and publicly accessible method of estimating the number of active federal wells in the New Mexico portion of the Permian Basin was to utilize the BLM New Mexico Geographic Information System (GIS) and the New Mexico Conservation Division ONGARD Data Search Page. ONGARD was searched for all active, new, and temporarily abandoned wells in NM (54,137), then refined the search to include only Chaves and Roosevelt counties (3,595),

and finished the search by limiting the results to Federal wells (1,589).

Table 5 estimated that the total emissions from Federal leases in the Permian Basin in 2008 were 569,573 metric tons CO_2e. Therefore, the estimate of emission per well is 35.84 metric tons CO_2e annually. In the unlikely event that 10 separate wells (five wells per lease parcel) were drilled on the proposed leases, the maximum emissions resulting from the lease sale would be 358.45 metric tons CO_2e per year.

Table 5: Potential Greenhouse Gas Emissions Resulting from Proposed Lease Sale Referenced to Latest Available Estimates from 2008

Total U.S. GHG Emissions From All Sources	6,956,800,000 metric tons	100.00 %
Total U.S. GHG Emissions From Oil & Gas Field Production	51,500,000 metric tons	.4%
Total New Mexico Emissions From Oil & Gas Field Production	2,252,603 metric tons	.03%
Total Permian Basin Emissions From Oil & Gas Field Production (1,589 wells)	569,573 metric tons	.01%
Total Potential GHG Emissions From Oil & Gas Field Production at Full Development For Proposed Lease Sale (10 Wells)	358 metric tons	.00006%

Environmental impacts of GHG emissions from oil and gas consumption are not effects of the proposed action as defined by the Council on Environmental Quality, and thus are not required to be analyzed under NEPA. Greenhouse gas emissions from consumption of oil and gas are not direct effects under NEPA because they do not occur at the same time and place as the action. They are also not indirect effects because oil and gas leasing and production would not be a proximate cause of greenhouse gas emissions resulting from consumption.

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 CO_2 and CH_4 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 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 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 parcels recommended to proceed for sale. All 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 of 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

4.5.2 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 power lines 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 power lines 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 breech, 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.

4.5.3 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. 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 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.

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.

4.7 Vegetation

There would be no direct effects to vegetative resources from the sale of the lease parcels. Subsequent exploration/development of the proposed leases 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 parcels. 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.

Vegetation would be lost within the construction areas of pads, roads, and rights of ways. Those areas covered in caliche, such as pads and roads, would have no vegetation for the life of the well. Rights-of-ways could re-vegetate in one to two years with proper reclamation and adequate precipitation. Inadequate precipitation over several growing seasons could result in loss of vegetative cover, leading to weed invasion and deterioration of native vegetation.

Impacts to vegetation depend on development. These acres would produce no vegetation, due to caliche covered surfaces with each well in production. These acres should be in adequate vegetative cover in three to five growing seasons, if adequate precipitation is received after following interim or final reclamation.

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.

4.8 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.

Based on a estimated spacing of 9 acres per well, a range of 45 to 198 acres would have the potential to be directly affected by invasive or non- native species. Due to wind drift or rain flows additional areas may be impacted by the spread or encroachment of noxious weeds.

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.

4.9 Special Status Species

4.9.1 Threatened or Endangered Species

There are no threatened or endangered species that occur within the listed parcels.

4.9.2 Other Special Status Species

Lesser Prairie-Chicken
Development of leases with suitable lesser prairie-chicken habitat could potentially impact local populations of lesser prairie-chicken. Construction of the location and around-the-clock noise

generated from drilling of the well could impact the lesser prairie- chicken by reducing the establishment of seasonal "booming grounds" or leks, thus possibly reducing reproductive success in the species. It is believed that the noise generated by drilling rigs or propane/diesel operated pumpjack motors (unmuffled) could mask the booming of the male prairie-chicken and thus, the females cannot hear the booming. In turn, female lesser prairie-chicken would not arrive at the booming ground, and subsequently, there would be decreased courtship interaction and possibly decreased reproduction. Decreased reproduction and the loss of recruitment into the local population would result in an absence of younger male lesser prairie-chickens to replace mature male lesser prairie-chicken once they expire, eventually causing the lek to disband and become inactive. Additionally, habitat fragmentation caused by development could possibly decrease the habitat available for nesting, brooding and feeding activities.

Sand Dune Lizard

Construction of the location in sand dune complexes that are suitable habitat or occupied habitat could impact local populations of sand dune lizard by reducing the size of habitat available to the species and possibly extirpating sand dune lizards from the location. However, with the negotiation of well pads, roads and infrastructure associated with the development of the oil field, extirpations of local populations of sand dune lizard could be avoided as long as development is moved out of occupied and/or suitable sand dune lizard habitat.

Potential Mitigation: Lesser Prairie-Chicken

Lesser prairie-chicken are afforded specific protection measures pertaining to new drilling under the Pecos District Special Status Species Resource Management Plan Amendment of 2008. The protections include a ban on new drilling during the breeding season (between March 1 and June 15) and a restriction on other production activities, such as land survey and construction, between the hours of 3 a.m. and 9 a.m. These restrictions apply to areas that contain lesser prairie-chicken habitat consisting of tall bunchgrasses (*Andropogon* spp., *Sporobolus* spp.), sand sage (*Artemisia filifolia*), and typically shinnery oak (*Quercus havardii*). Exceptions to the stipulations will be considered under the criteria set forth in the RMPA.

Accordingly, approval of a permit to drill a well in lesser prairie-chicken habitat would be granted subject to the following conditions (SENM-S-22):

Stipulations for Lesser Prairie-Chicken Habitat

Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1 through June 15 annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration or 3-D seismic operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

Exceptions to the above requirements will be considered in emergency situations such as mechanical failures, however, these exceptions will not be granted if BLM determines, on the basis of biological data or other relevant facts or circumstances, that the grant of an exception would disrupt prairie-chicken booming activity during the breeding season. Requests for exceptions on a non-emergency basis may also be considered but these exceptions will not be granted if BLM determines that there are prairie-chicken sightings, historic leks and or active leks within 1.5 miles of the proposed location, or any combination of the above mentioned criteria combined with suitable habitat. The RMPA also identifies where non-emergency exceptions will not be granted, including Habitat Evaluation Areas.

If observations of lesser prairie-chickens are made, the operator would be required to immediately notify the local BLM office.

In addition, raptors have been observed using plugged and abandoned well markers as perches. Artificial perches may increase raptor presences in a given area. Furthermore, artificial perches may provide strategically-located vantage points and may improve the hunting efficiency of raptors. In order to improve the probability of maintaining a stable lesser prairie-chicken population, low profile plugged and abandoned well markers would be attached as a COA to all APDs occurring within LPC habitat in the 2008 Special Status Species RMPA planning area. The well marker would be approximately 2 inches above ground level and contain the following information: operator name, lease name, and well number and location, including unit letter, section, township, and range. The previous listed information will be welded, stamped, or otherwise permanently engraved into the metal of the marker.

Potential Mitigation: Sand Dune Lizard

Surface disturbance will not be allowed in documented occupied habitat areas, or within up to 100 meters of suitable habitat associated with occupied habitat areas identified through field review. An exception to this restriction will be considered when an on-site evaluation of habitat extent, available species occurrence data, the proposed surface use, and proposed mitigations indicate the proposal will not adversely affect the local population.

Special Status Species RMPA

Parcels nominated in these areas are reviewed by the State Director for concurrence based on the Record of Decision and Approved Resource Management Plan Amendment of April 2008. The BLM will continue to require oil and gas lessees to conduct operations in a manner that will minimize adverse impacts to wildlife and special status species. To that end, the BLM will continue to apply reasonable measures to all oil and gas activities.

Leasing with requirements for Plans of Development (PODs) or Conditions of Approval (COAs) to ensure orderly development within a minimum of surface impact in lesser prairie-chicken and sand dune lizard habitats will be considered on a case-by-case basis, providing impacts from exploration and development will not cause unnecessary or undue impact to efforts to restore habitat. PODs may not be required for every existing lease on the Planning Area, but are required when requested by the BLM.

4.10 Wildlife

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.

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.

4.11 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 controlling livestock movement by maintaining fence line integrity, fencing of facilities, revegetation of disturbed sites, installation of cattleguards, and fugitive dust control.

4.12 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 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 state land or county or state roads, oil and gas activities would have little or no affect on the recreational opportunities in this area. In larger blocks of public land recreation activities that could occur within this area are limited to access from BLM lands, county roads or through state land during hunting seasons.

4.13 Visual Resources

Visual resource management is divided into four VRM classes. In the tracts proposed for leasing only VRM classes III and IV are represented.

The VRM Class III objective is to partially retain existing landscape character. The level of change to the characteristic landscape should 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. Facilities, such as produced water, condensate 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. The construction of an access road, well pad and other ancillary facilities, other than facilities greater in height than eight feet, would slightly 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 Roswell RMP (1997, p. AP1-4). Depending on the production nature of the well site, multiple low-profile condensate and/or oil or produced water tanks would be necessary to accommodate the project. Through color manipulation, by painting well facilities to blend with the rolling to flat vegetative and/or landform setting with a flat gray-green color, the view is expected to favorably blend with the form, line, color and texture of the existing landscape. The flat color Juniper Green from the supplemental environmental colors also closely approximates the gray green color of the setting. 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. Facilities with low-profile horizontal line and form would facilitate favorable blending as older facilities go out of production and are removed.

The VRM Class IV objective is to provide for management activities which require major modification of the existing landscape character. Every attempt, however, should be made to reduce or eliminate activity impacts through careful location, minimal disturbance, and repeating the basic landscape elements. 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. The construction of an access road, well pad and other ancillary facilities would slightly modify the existing area visual resources. Through color manipulation, by painting well facilities to blend with the rolling to flat vegetative and/or landform setting with a gray-green color. The view is expected to favorably blend with the form, line, color and texture of the existing landscape. The flat Juniper Green from the

supplemental environmental colors also closely approximates the gray green color of the setting. All facilities, including the meter building, would be painted this color. Adverse visual impacts can be avoided by gradually moving into a more appropriate vegetative/landform setting color scheme.

Through color manipulation, by painting well facilities to blend with the rolling to flat vegetative and/or landform setting with a gray-green the view is expected to favorably blend with the form, line, color and texture of the existing landscape

Potential Mitigation: The flat color Juniper Green from the Standard Environmental Colors Chart is to be used on all facilities to closely approximate the vegetation within the setting. All facilities, including the meter building, would be painted this color. If the proposed area is in a scenic corridor a low profile tank less than eight feet in high may be recommended for the proposed action.

4.14 Cave/Karst

While the act of leasing Federal minerals produces no direct impacts, subsequent development of a lease would generate impacts to cave/karst resources. However, the tracts proposed for leasing are located in a low karst potential area and there were no cave/karst features located within or within the vicinity of the leases. Because the lease is in a low karst potential area there will be little to no impacts to cave/karst resources.

4.15 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 impacts due to overall employment opportunities related to the oil and gas and service support industry in the region, as well as the economic benefits to State and County governments related to royalty payments and severance taxes. Other impacts could include a small increase in activity and noise disturbance in areas used for grazing, wood gathering or hunting. However, these impacts would apply to all public land users in the project area.

4.16 Cumulative Impacts

There are about 4,500 wells in the Roswell Field Office. Federal wells are approximately 40 percent (1,800) of this total.

Estimates of total surface disturbance for all alternativesare based on full field development. Full field development assumes development of every spacing unit and has a total complement of roads, pads, power lines, gravel sources and pipelines. Exploration and development of hydrocarbon resources outside of well-developed areas increases the distance required for roads, pipelines, and power lines. The parcels considered under all alternatives are not within or near well-developed fields.

The surface disturbance assumptions shown in the following table estimates the preferred alternative impacts associated with oil and gas exploration and development drilling activities in these areas.

- Access Roads: 14 foot-wide travel way, 3.0 acres disturbance per access road
- Drill Pads: 1.4 acres disturbance per average well pad (250 feet x 250 feet
- Pipelines: 3.6 acres initial disturbance per producing well (30 feet right-of-way width)
- Power lines: 1.0 acre initial disturbance per producing well
- **Total Surface disturbance: 9 acres**

Parcel	**Comments**	**Parcel Acreage**	**40-acre Spacing**	**160-acre Spacing**	**320-acre Spacing**
NM-201110-008 T.0150S, R.0290E, NM PM, NM Sec. 023 E2SE; 026 E2; Chaves County Roswell FO	Lease with the following Stipulations: NM-11-LN – Special Cultural SENM-S-22 Prairie Chickens (Preferred Alternative only)	400	10	2	1
Total		400	10	2	1

Cumulative Impact Table (Based on Full Field Development)

Analysis of cumulative impacts for reasonably foreseeable development (RFD) of oil and gas wells on public lands in the Roswell Field Office was presented in the 1994 Draft Roswell Resource Management Plan (RMP). The RFD was validated in the 2006 Draft Special Status Species RMP Amendment. Potential development of all available federal minerals in the field office, including those in the proposed lease parcels, was included as part of the analysis.

4.16.1 Climate Change

This section incorporates an analysis of the contributions of the proposed action to GHG emissions and a general discussion of potential impacts to climate. The EPA's Inventory of US Greenhouse Gas Emissions and Sinks found that in 2007, total U.S. GHG emissions were over 7 billion metric tons and that total U.S. GHG emissions have increased by 17% from 1990 to 2007. Emissions increased from 2006 to 2007 by 1.4 percent (99.0 Tg. CO_2e). The following factors were primary contributors to this increase: (1) cooler winter and warmer summer conditions in 2007 than in 2006 increased the demand for heating fuels and contributed to the increase in the demand for electricity, (2) increased consumption of fossil fuels to generate electricity and (3) a significant decrease (14.2 percent) in hydropower generation used to meet this demand (EPA 2009).

On-going scientific research has identified the potential effects of anthropogenic GHG emissions

such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and several trace gasses; changes in biological carbon sequestration; and other changes due to land management activities on global climate. Through complex interactions on a global scale, GHG emissions cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although natural GHG atmospheric concentration levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and burning of fossil carbon sources have caused GHG concentrations to increase.

Analysis of cumulative impacts for reasonably foreseeable development (RFD) of oil and gas wells on public lands in the Farmington Field Office was presented in the 2003 Resource Management Plan (RMP). Potential development of all available federal minerals in the field office, including those in the proposed lease parcels, was included as part of the analysis.

This incremental contribution to global GHG gases cannot be translated into effects on climate change globally or in the area of this site-specific action. As oil and gas production technology continues to improve, and because of the potential development of future regulation or legislation, one assumption is that reductions in the rate or total quantity of GHG emissions associated with oil and gas production are likely. As stated in the direct/indirect effects section under climate change, the assessment of GHG emissions and the resulting impacts on climate is an ongoing scientific process. It is currently not feasible to know with certainty the net impacts from the proposed action on global or regional climate—that is, while BLM actions may contribute to the climate change phenomenon, the specific effects of those actions on global climate are speculative given the current state of the science. Therefore, the BLM does not have the ability to associate an action's contribution in a localized area to impacts on global climate change. Further, an IPCC assessment states that difficulties remain in attributing observed temperature changes at smaller than continental scales. It is currently beyond the scope of existing science to predict climate change on regional or local scales resulting from specific sources of GHG emissions.

Currently, global climate models are inadequate to forecast local or regional effects on resources (IPCC, 2007; CCSP, 2008). However, there are general projections regarding potential impacts to natural resources and plant and animal species that may be attributed to climate change from GHG emissions over time; however these effects are likely to be varied, including those in the southwestern United States. For example, if global climate change results in a warmer and drier climate, increased particulate matter impacts could occur due to increased windblown dust from drier and less stable soils. Cool season plant species' spatial ranges are predicted to move north and to higher elevations, and extinction of endemic threatened/endangered plants may be accelerated. Due to loss of habitat or competition from other species whose ranges may shift northward, the population of some animal species may be reduced or increased. Less snow at lower elevations would likely impact the timing and quantity of snowmelt, which, in turn, could impact water resources and species dependant on historic water conditions (Karl et al., 2009).

The New Mexico Greenhouse Gas Inventory and Reference Case Projection 1990-2020 (Inventory) estimates that approximately 17.3 million metric tons of GHGs from the natural gas industry and 2.3 million metric tons of GHGs from the oil industry are projected in 2010 as a result of oil and natural gas production, processing, transmission and distribution. As of 2008,

there were 23,196 oil wells and 27, 778 gas wells in New Mexico (NM well statistics).[1]

When compared to the total GHG emission estimates from the total number of oil and gas wells in the State, the average number of oil and gas wells drilled annually in the Field Office and associated GHG emission levels, represent an incremental contribution to the total regional and global GHG emission levels. The number of oil and gas wells that would eventually result from the proposed action would therefore likely represent an even smaller incremental contribution to GHGs emissions on a global scale.

5.0 Consultation/Coordination

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

5.1 Agencies, Persons and Organizations Consulted

Agencies
George Farmer, SE Area Habitat Specialist, New Mexico State Game and Fish
Ty Allen, USFWS Biologist

Tribes Consulted
Apache Tribe of Oklahoma
Comanche NationKiowa
TribeMescalero Apache Tribe
Ysleta del Sur Pueblo

5.2 Public Involvement

The parcel nominated for this sale, along with the appropriate stipulations from the RMP, were posted online for a two week review period. No comments were received. This EA was made available for public review and comment for 30 days beginning May 26, 2011. No comments were received.

5.3 Preparers

BLM Lease Staff
Glen Garnand, Environmental Protection Specialist
Jared Reese, Natural Resource Specialist
Ernest Jaquez, Natural Resource Specialist
Al Collar, Geologist

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[1] In 2000, approximately 17 million metric tons and 2.3 million metric tons were respectively attributed to natural gas and oil activities. As of 2002, the Inventory indicates that there approximately 21,771 oil wells and 23,261 gas wells in the State. Significant uncertainties remain with respect to: the quality of historical field data, processing, and pipeline use of natural gas, does not factor in reclaimed wells and total number of new wells drilled per year; CO2 emissions from enhanced oil recovery, which have not been estimated; and refinery fuel use-EIA indicates less than half the refinery fuel use as indicated by refinery permit data.

Helen Miller, Rangeland Management Specialist
Justin W. Peters, Archaeologist
Michael McGee, Hydrologist
Bill Murry, Outdoor Recreation Planner
John Simitz, Geologist
Randy Howard, Wildlife Biologist
Dan Baggao, Wildlife Biologist
Angel Mayes, Assistant Field Manager - Lands & Minerals
Phil Watts, GIS Specialist
Knutt Peterson, GIS Specialist (SCEP)
Jerry Dutchover, Minerals
Howard Parman, Planning and Environmental Coordinator
David Glass, Petroleum Engineer
Tate Salas, Realty Specialist
Vanessa Saenz, Realty Specialist

On May 6, 2011 a briefing was held at the New Mexico State Office with the State Director Linda Rundell, members of the Fluid Minerals team including Gloria Baca, Margie Dupre, etc.

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U.S. Department of the Interior, Bureau of Land Management. May 2008. Special Status Species Record of Decision and Approved Resource Management Plan Amendment. Pecos District Office, New Mexico.

7.1 Authorities

Code of Federal Regulations (CFR) 3100
40 CFR All Parts and Sections inclusive Protection of Environment, Revised as of July 1, 2001.
43 CFR, All Parts and Sections inclusive - Public Lands: Interior. Revised as of October 1, 2000.

U.S. Department of the Interior, Bureau of Land Management and Office of the Solicitor (editors). 2001. The Federal Land Policy and Management Act, as amended. Public Law 94-579.

APPENDIX 1

OCTOBER 19, 2011 DRAFT SALE NOTICE - ROSWELL

NM-201110-008 400.000 Acres
T.0150S, R.0290E, NM PM, NM
Sec. 023 E2SE;
026 E2;
Chaves County
Roswell FO
NMNM 0458356,NMNM 0493370A
NMNM 0556543, NMNM 81928
Formerly Lease No.
Stipulations:
NM-11-LN Special Cultural Resource
SENM-S-22 Prairie Chickens
SENM-LN-5 Offsite Mitigation