

United States Department of the Interior  
Bureau of Land Management  
Las Cruces District Office  
1800 Marquess Street  
Las Cruces, NM 88005

Environmental Assessment for
<b>July 2013 COMPETITIVE OIL AND GAS LEASE SALE</b>
Otero County, New Mexico
<b>DOI-BLM-NM-L000-2012-0156-EA</b>

-----  
Signature and Title of Project Lead Date

\_\_\_\_\_  
Signature of Planning & Environmental Coordinator Date



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

**Project: July 2013 Competitive Oil and Gas Lease Sale**

**EA Log Number: DOI-BLM-NM-L000-2012-0156-EA**

**Location: Otero County, New Mexico**

**Finding of No Significant Impact**

Based on the analysis of potential environmental impacts contained in the attached Environmental Assessment (EA), I have determined the Preferred Alternative is not expected to have significant impacts on the environment.

The impacts of leasing the fluid minerals estate in the areas described within this EA have been previously analyzed in the White Sands RMP (1986), as amended 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 (EIS) is not warranted.

Prepared by:

\_\_\_\_\_ Date: \_\_\_\_\_

Natural Resource Specialist

Reviewed by:

\_\_\_\_\_ Date: \_\_\_\_\_

Bill Childress  
District Manager, Las Cruces District Office

Approved by:

\_\_\_\_\_ Date: \_\_\_\_\_

Jesse Juen  
State Director, New Mexico

**BUREAU OF LAND MANAGEMENT  
LAS CRUCES DISTRICT OFFICE**

**ENVIRONMENTAL ASSESSMENT FOR  
July 2013 COMPETITIVE OIL AND GAS LEASE SALE  
DOI-BLM-NM-L000-2012-0156-EA**

**1 INTRODUCTION**

It is the policy of the Bureau of Land Management (BLM) as derived from various laws, including the Mineral Leasing Act of 1920, 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 competitive quarterly 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, is published by the 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 what public land and minerals are open for leasing and what leasing stipulations may be 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 BLM in consultation with the appropriate surface management agency or the private surface owner.

In the process of preparing a lease sale the NMSO sends a draft parcel list to any Field Offices in which parcels are located. Field Office staff then review legal descriptions of the parcels to determine if they are in areas open to leasing; if appropriate stipulations have been included; 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, and the appropriate stipulations from the RMP, are posted online for a two week public scoping period. Comments received are reviewed and incorporated into the Environmental Assessment (EA).

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

This EA documents the Las Cruces District Office (LCDO) review of the 37 parcels nominated for the July 2013 Competitive Oil and Gas Lease Sale that are under the administration of the LCDO. It serves to verify conformance with the approved land use plan and 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.

The parcel and applicable stipulations were posted online for a two-week public scoping period beginning on January 28, 2013. Comments were received from the Center for Biological Diversity. In addition, this EA is made available for public review and comment for 30 days beginning on March 1, 2013. Any comments provided prior to the lease sale, including those received from the Center for Biological Diversity, will be considered and incorporated into the EA as appropriate.

## **1.1 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 land through a competitive leasing process.

The need of the action is established by the BLM's responsibility under the Mineral Leasing Act of 1920 (MLA), as amended, to promote the exploration and development 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 these nominated parcels and, if so, under what terms and conditions.

## **1.2 Conformance with Applicable Land Use Plan and Other Environmental Assessments**

The applicable land use plan for this action is the 1986 White Sands Resource Management Plan (RMP) Oil & Gas Leasing pp.18-27. The RMP designated approximately 1,729,292 acres of Federal minerals open for continued oil and gas development and leasing under Standard Terms and Conditions. The RMP also describes specific stipulations that would be attached to new leases offered in certain areas. Therefore, it is determined that the alternatives considered conform to fluid mineral leasing decisions in the 1986 White Sands RMP consistent with the goals and objectives for natural and cultural resources.

Pursuant to 40 Code of Federal Regulations (CFR) 1508.28 and 1502.21, this EA is tiered to and incorporates by reference the information and analysis contained in the 1986 White Sands Resource Management Plan (RMP) and Final Environmental Impact Statement. The Final Resource Management Plan was approved by the Record of Decision (ROD) signed October 1986. 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 1986 White Sands RMP. 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.

The 1986 White Sands RMP currently being revised by what has been named the Tri-County RMP. The Draft RMP/EIS for the Tri-County RMP is scheduled to be published in March, 2013. While the Tri-County Draft RMP/EIS is a comprehensive planning document for almost all resources, decisions relating to fluid minerals are not currently included in the document. In 2005, the BLM completed a RMP Amendment for fluid mineral leasing and development in Sierra and Otero Counties. The BLM intended to carry the management decisions in that plan amendment into the Tri-County RMP for the two counties. However, the court decision *New Mexico v. BLM*, 565 F.3d 683 (10th Cir. 2009) and *New Mexico ex rel. Richardson v. BLM*, 459 F. Supp. 2d 1102 (D.N.M. 2006) setting aside the RMP Amendment nullified the decisions in the RMPA. Consequently, management of oil and gas leasing reverted back to the decisions

made in the White Sands RMP. These decisions will be incorporated into the document through either a Supplemental Draft EIS, to be initiated after the public comment period on the Draft RMP/EIS, or through an RMP amendment, to be initiated after signature of the Record of Decision. At this point, because no fluid minerals decisions exist in the current Tri-County Draft RMP/EIS, the 1986 White Sands RMP is still the applicable land use plan, and decisions made under that plan are properly applied to the parcels nominated in this lease sale.

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).

### **1.3 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.

Potential for effects to threatened and endangered (T&E) species of oil and gas lease sales were analyzed at the Land Use Plan level in the 1986 White Sands Resource Management Plan (WSRMP). Stipulations would be assigned to any parcels leased that would require consultation with the United States Fish and Wildlife Service should potential impacts to Federally listed Threatened or Endangered Species be identified at the Application for Permit to Drill phase. The result of such a consultation could result in restrictions to the temporal or spatial aspects of lease development.

Compliance with the provisions of the 2009 Paleontological Resources Protection Act (PRPA; Public Law 111-011) requires that the Department of the Interior consider the potential impacts of development plans on significant fossil resources and allow for the implementation of mitigation measures where necessary. Initial compliance is an internal process where the potential for significant paleontological resources to be present is established by a review of the Potential Fossil Yield Classification System (PFYC) for the Area of Potential Effects (APE). Numerical ranking of the associated geological formations under the PFYC system in terms of fossil potential dictates the direction of additional compliance measures. These may range from a determination of no effect to the requirement that a paleontological survey be conducted by appropriate specialists and that further action adheres to any subsequent recommendations.

Compliance with Section 106 responsibilities of the National Historic Preservation Act are adhered to by following the Protocol Agreement between New Mexico Bureau of Land Management 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.

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 special stipulations need to be attached as lease stipulations.

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 resulting from consultation on the split estate issue with affected private surface owners, the oil and gas industry, and other interested parties.

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

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

#### **1.4 Identification of Issues**

An internal review of the Proposed Action was conducted by an interdisciplinary team of the LCDO resource specialists on February 4, 2013 to identify and consider potentially affected resources and associated issues.

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](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 January 28<sup>th</sup> through February 11, 2013. Comments were received from the Center for Biological Diversity.

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

- Will native fish and riparian systems be impacted by surface disturbance and drilling activities?
- Wildlife and Wildlife Habitat would be impacted by leasing certain parcels.
- Special Status Plant and Animal Species would be impacted by leasing certain parcels.

- Will on-going drought and limited water availability interact with oil and gas development and ultimately degrade riparian systems and water quality?
- Relevance and importance criteria in the Sacramento Mountains Areas of Critical Environmental Concern would be degraded by oil and gas development.
- Cultural Resources throughout the nominated parcels would best be managed by initiating parcel wide surveys.
- Are BMPs suitable for protecting Sensitive and Fragile soils of the Tularosa watershed?
- Will leasing lead to impacts to the Community Watershed?
- Some areas of the nominated lease parcels have a high potential for Paleontological Resources and these areas should not be impacted.
- Can oil and gas development occur in this area without impacts to visual contrast in areas with Visual Resource Management Class II
- Livestock Grazing Operators do not want their ranching operations to be negatively impacted by oil and gas development.
- Oil and gas leasing may lead to the introduction and propagation of Noxious Weeds and other Invasive, Non-Native Species.
- Could this activity disproportionately impact minority or low income populations?
- How will Air Resources be impacted by leasing and subsequent oil and gas development?

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: Prime or Unique Farmlands, Wild and Scenic Rivers, Wilderness or Wilderness Study Areas, and Wild Horses and Burros.

## **2 DESCRIPTION OF PROPOSED ACTIONS AND ALTERNATIVES**

### **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 parcels would not be offered for lease during the July 2013 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. Selection of the no action alternative would not preclude these parcels from being nominated and considered in a future lease sale.

### **2.3 Alternative B – Proposed Action**

The Proposed Action is to lease the 37 parcels of federal minerals nominated by the public (Figure 1), covering approximately 43,160 acres administered by the LCDO, for oil and gas exploration and development. Standard terms and conditions as well as stipulations listed in the RMP would apply. A complete description of these parcels, including any stipulations, is provided in Section 2.4.

All development activities proposed under the authority of these leases within the 37 parcels would be subject to compliance with Section 106 of the National Historic Preservation Act (NHPA) and Executive Order 13007.

Once sold, the lease purchaser has the exclusive right to use so much of the leased lands as is reasonably necessary to explore and drill for all of the 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, exclusive right to develop the leasehold reverts back to the federal government and the lease can be reoffered in another lease sale.

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.

## **2.4 Alternative C - Preferred Alternative**

The Preferred Alternative is developed in response to the circumstances within 26 lease parcels where further evaluation of specific issues is necessary before the BLM can assure an adequately informed decision can be made. The unresolved issues related to the 26 parcels include potential impacts to sensitive and erosive soils, critical community watersheds, riparian areas, steep topography, impacts to special status species and their habitats, springs and seeps, and impacts to the proposed Sacramento Mountains ACEC. Under this alternative, the BLM would lease for oil and gas 11 nominated parcels of federal minerals, covering 11,417.7 acres and recommend for a later decision 26 parcels, covering 31,742.9 acres (Figures 2 and 3).

The 26 lease parcels not offered in this lease sale will be analyzed in an Environmental Assessment for the January 2014 Oil and Gas Lease Sale.

The parcels are divided into two groups (A and B) that were primarily determined by the percentage of topographical slope being greater than 5% (Group A) and less than 5% (Group B) (Figure 4). In the Tularosa Watershed, soils occurring on slopes greater than 5% are known to be highly erosive. Other factors such as soil type and riparian values were also considered for sorting parcels into Groups A and B.

Parcel numbers, locations, stipulations and acreages for the 11 leasable parcels (Group B) are listed below. Lease stipulations (as required by Title 43 Code of Federal Registration 3101.3) would be added to the 11 parcels to address site specific concerns (See Appendix 1 for a summary of the lease stipulations).

Once sold, the lease purchaser has the exclusive right to use so much of the leased land as is necessary to explore and drill for all of the oil and gas within the lease boundaries, subject to the stipulations attached to the lease (Title 43 Code of Federal Registration 3101.1-2).

Oil and gas leases are issued for a 10-year period and continue for as long thereafter as oil or gas is produced in paying quantities. If a lessee fails to produce oil and gas, does not make annual rental payments, does not comply with the terms and conditions of the lease, or relinquishes the lease; exclusive right to develop the lease reverts back to the federal government and the lease can be reoffered in another lease sale. Drilling of wells on a lease is not permitted until the lease owner or operator secures approval of a drilling permit and a surface use plan specified under Onshore Oil and Gas Orders listed in Title 43 Code of Federal Registration 3162. A permit to drill would not be authorized until site-specific NEPA analysis is conducted.

All development activities proposed under the authority of these leases within the 36 parcels 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 developed through the parcel review and analysis process to address site specific concerns or new information not identified in the land use planning process would apply as appropriate to each lease. In addition, site specific mitigation measures and Best

Management Practices (BMPs) identified in the BLM Gold Book, revised 2007 may be attached as Conditions of Approval (COAs) for each proposed exploration and development activity authorized on a lease.

Two new stipulations are being developed to protect resources such as floodplains, playas and alkali lakes within areas that contain these features. The stipulations would prohibit surface disturbance within up to 200 meters of the outer edge of a 100-year floodplain, playa and alkali lake, to protect the integrity of these features. This stipulation would be applied to parcels 004, 005, 006, 007, 008, 021 and 152.

Figure 1 Overview of Lease Sale Parcels and Land Status.

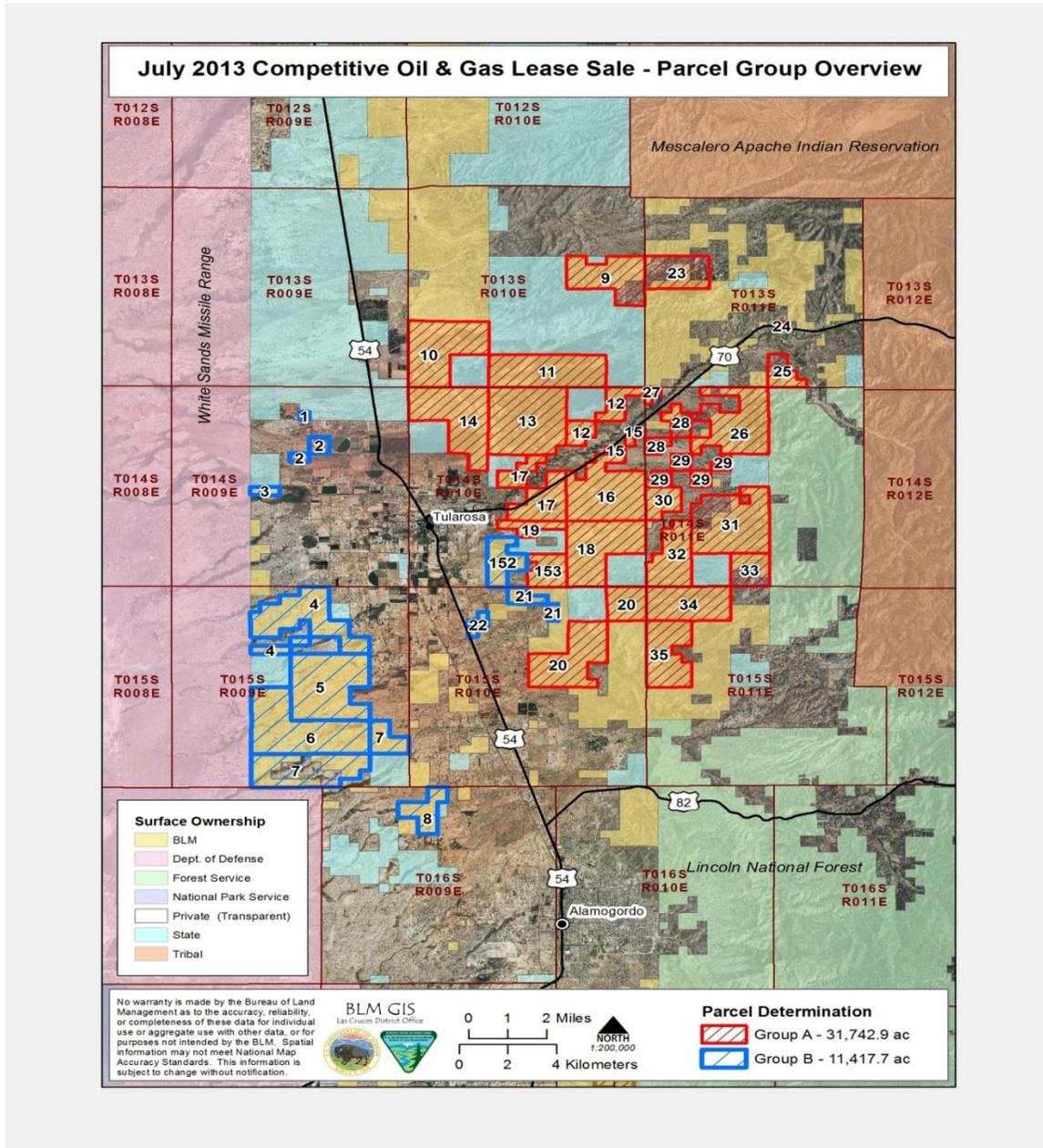


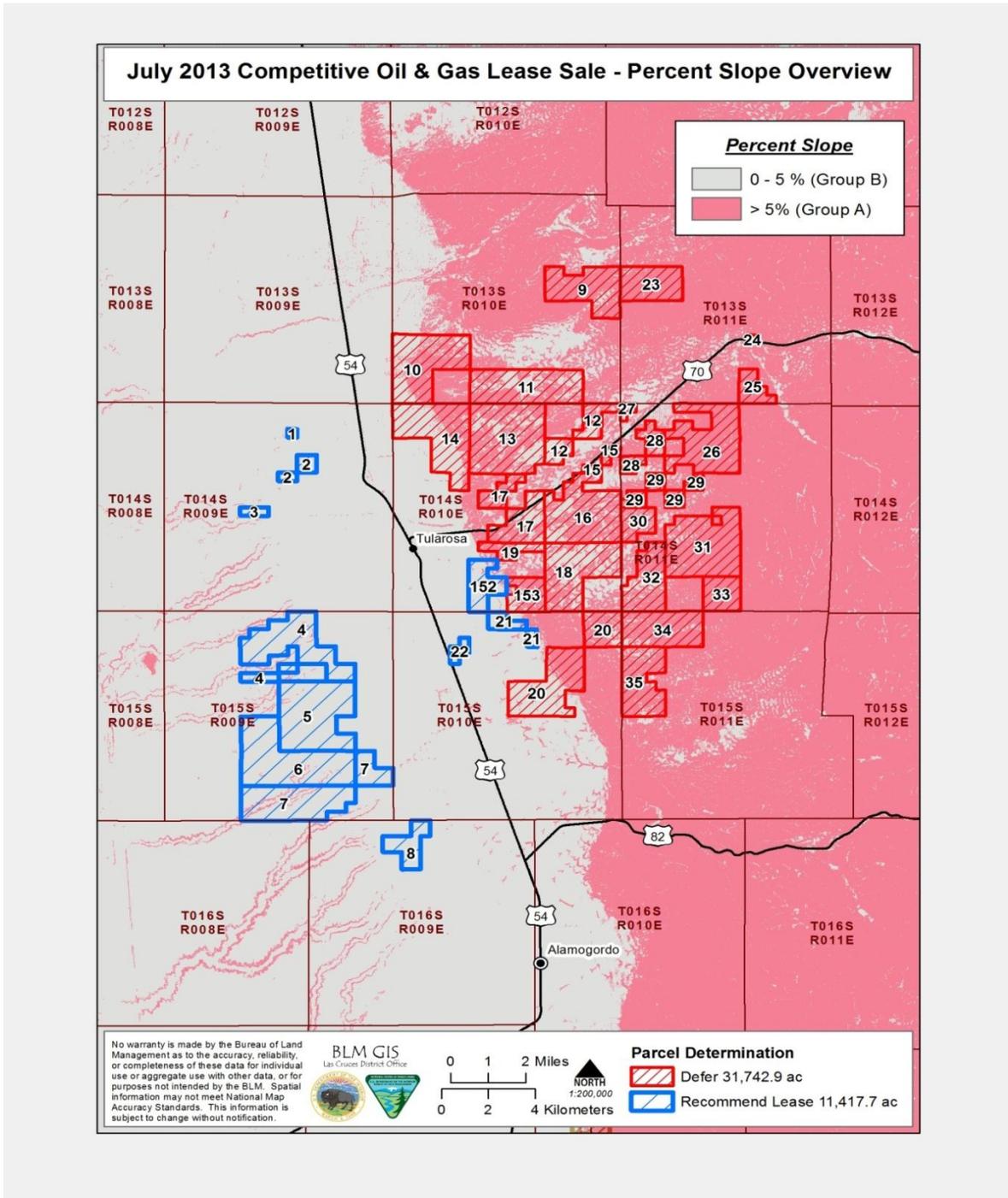
Figure 2 Lease sale parcels deferred from analysis (Group A parcels).

<b>JULY 2013 LEASE SALE PARCELS DEFERRED FOR FURTHER ANALYSIS (Group A)</b>		
<b>Parcels</b>	<b>TOTAL ACRES</b>	<b>DEFER</b>
NMNM201307-009	1440	1440
NMNM201307-010	2013.650	2013.650
NMNM201307-011	1920	1920
NMNM201307-012	762.880	762.880
NMNM201307-013	2532.560	2532.560
NMNM201307-014	2094.49	2094.49
NMNM201307-015	160	160
NMNM201307-016	2080	2080
NMNM201307-017	1360	1360
NMNM201307-018	1920	1920
NMNM201307-019	360	360
NMNM201307-020	2372.290	2372.290
NMNM201307-023	1064.62	1064.62
NMNM201307-024	40	40
NMNM201307-025	440	440
NMNM201307-026	1985.040	1985.040
NMNM201307-027	95.640	95.640
NMNM201307-028	494.08	494.08
NMNM201307-029	626.30	626.30
NMNM201307-030	507.04	507.04
NMNM201307-031	2280	2280
NMNM201307-032	1156.820	1156.820
NMNM201307-033	640	640
NMNM201307-034	1429.320	1429.320
NMNM201307-035	1368.200	1368.200
NMNM201307-153	600	600
<b>TOTAL</b>	<b>31,742.9</b>	<b>31,742.9</b>

**Figure 3 Leasable Parcels analyzed in this Environmental Assessment (Group B Parcels)**

<b>JULY 2013 LEASE SALE PARCELS AVAILABLE FOR LEASE (Group B Parcels)</b>		
<b>PARCEL NUMBERS</b>	<b>TOTAL ACRES</b>	<b>ACREAGE OF PARCEL AVAILABLE FOR LEASE</b>
NMNM201307-001	40	40
NMNM201307-002	240	240
NMNM201307-003	120	120
NMNM201307-004	2046.510	2046.510
NMNM201307-005	2400	2400
NMNM201307-006	2560	2560
NMNM201307-007	2240	2240
NMNM201307-008	611	611
NMNM201307-021	325.14	325.14
NMNM201307-022	155	155
NMNM201307-154	680	680
<b>TOTAL</b>	<b>11,417.7</b>	<b>11,417.7</b>

Figure 4 Topographic slope of lease parcels.



A lease notice would be attached to the parcel identified below to notify potential lessees of one circumstance which may require special consideration or measures at the time surface disturbance—any modification, use, or occupancy of the surface of a lease parcel authorized by approval of an Application for Permit to Drill (APD)—is proposed on the lease. Parcels are listed under the respective notices to be applied under the Preferred Alternative.

**Lease Notice - Occurrence of Rangeland Monitoring Plot**

This lease contains one rangeland monitoring plot, consisting of approximately two acres, which may require avoidance from any surface disturbing activities.

Applicable parcel:

NM-201207-006

Parcels recommended for leasing under the Preferred Alternative with stipulations are presented below (Figure 5):

**Figure 5 Proposed Stipulations for the July 2013 Lease Sale Parcels**

<b>Parcel</b>	<b>Stipulations</b>	<b>Acres</b>
<b><u>NM-201307-001</u></b> T.0140S, R.0090E, NMPM, NM Sec. 003 SESW; Otero County	LC-3 CSU Off Road Vehicle Use LC-14 CSU Threatened & Endangered Species Habitat LC-48 TCP Traditional Cultural Properties NM-11-LN Cultural Resource Lease Notice WO-ESA-7 Endangered Species Act Consultation	40.000
<b><u>NM-201307-002</u></b> T.0140S, R.0090E, NMPM, NM Sec. 010 SE; 015 N2NW; Otero County	LC-3 CSU Off Road Vehicle Use LC-14 CSU Threatened & Endangered Species Habitat LC-48 TCP Traditional Cultural Properties NM-11-LN Cultural Resource Lease Notice WO-ESA-7 Endangered Species Act Consultation	240.000
<b><u>NM-201307-003</u></b> T.0140S, R.0090E, NMPM, NM Sec. 021 N2NE, N2NW; Otero County	LC-3 CSU Off Road Vehicle Use LC-14 CSU Threatened & Endangered Species Habitat LC-48 TCP Traditional Cultural Properties NM-11-LN Cultural Resource Lease Notice WO-ESA-7 Endangered Species Act Consultation	120.000
<b><u>NM-201307-004</u></b> T.0150S, R.0090E, NMPM, NM Sec. 003 LOTS 1-3; 003 S2N2, S2; 004 SENE, E2SW, SWSW, SE; 009 N2NE, SWNE, NW, S2S2; 010 NE, NWNW,	LC-3 CSU Off Road Vehicle Use LC-14 CSU Threatened & Endangered Species Habitat LC-48 TCP Traditional Cultural Properties NM-11-LN Cultural Resource Lease Notice WO-ESA-7 Endangered Species Act Consultation LC-51 CSU Playa or Alkali Lake – Pending Development	2046.51 0

<b>Parcel</b>	<b>Stipulations</b>	<b>Acres</b>
N2SW; 011 NW, E2SW, SE; Otero County		
<b><u>NM-201307-005</u></b> T.0150S, R.0090E, NMPM, NM Sec. 014 ALL; 015 ALL; 022 ALL; 023 W2, SE; Otero County	LC-3 CSU Off Road Vehicle Use LC-14 CSU Threatened & Endangered Species Habitat LC-48 TCP Traditional Cultural Properties NM-11-LN Cultural Resource Lease Notice WO-ESA-7 Endangered Species Act Consultation LC-51 CSU Playa or Alkali Lake – Pending Development	2400.00 0
<b><u>NM-201307-006</u></b> T.0150S, R.0090E, NMPM, NM Sec. 021 ALL; 026 ALL; 027 ALL; 028 ALL; Otero County	LC-3 CSU Off Road Vehicle Use LC-14 CSU Threatened & Endangered Species Habitat LC-48 TCP Traditional Cultural Properties NM-11-LN Cultural Resource Lease Notice WO-ESA-7 Endangered Species Act Consultation LC-51 CSU Playa or Alkali Lake – Pending Development LC-XX-LN – Range Monitoring Plot Occurrence – Pending Development	2560.00 0
<b><u>NM-201307-007</u></b> T.0150S, R.0090E, NMPM, NM Sec. 025 NW, S2; 033 ALL; 034 ALL; 035 N2, N2SW, SWSW, NWSE; Otero County	LC-3 CSU Off Road Vehicle Use LC-14 CSU Threatened & Endangered Species Habitat LC-48 TCP Traditional Cultural Properties NM-11-LN Cultural Resource Lease Notice WO-ESA-7 Endangered Species Act Consultation LC-51 CSU Playa or Alkali Lake – Pending Development	2240.00 0
<b><u>NM-201307-008</u></b> T.0160S, R.0090E, NMPM, NM Sec. 003 LOTS 4; 003 SWNW; 004 LOTS 1; 004 SENE, S2; 009 NE; Otero County	LC-3 CSU Off Road Vehicle Use LC-14 CSU Threatened & Endangered Species Habitat LC-48 TCP Traditional Cultural Properties NM-11-LN Cultural Resource Lease Notice WO-ESA-7 Endangered Species Act Consultation LC-51 CSU Playa or Alkali Lake	611.000
<b><u>NM-201307-021</u></b> T.0150S, R.0100E, NMPM, NM Sec. 003 LOTS 10, 11; 003 S2NW; 004 LOTS 1, 2; 004 S2NE; Otero County	LC-3 CSU Off Road Vehicle Use LC-14 CSU Threatened & Endangered Species Habitat LC-48 TCP Traditional Cultural Properties NM-11-LN Cultural Resource Lease Notice WO-ESA-7 Endangered Species Act Consultation LC-52 CSU Floodplains – Pending Development	325.140

Parcel	Stipulations	Acres
<p><b><u>NM-201307-022</u></b>  T.0150S, R.0100E, NMPM,  NM  Sec. 005 SESE;  008 N2NENE,  SWNENE, N2SENENE;  008 W2NE;  Otero County</p>	<p>LC-3 CSU Off Road Vehicle Use  LC-14 CSU Threatened &amp; Endangered Species Habitat  LC-48 TCP Traditional Cultural Properties  NM-11-LN Cultural Resource Lease Notice  WO-ESA-7 Endangered Species Act Consultation</p>	<p>155.000</p>
<p><b><u>NM-201307-152</u></b>  T.0140S, R.0100E, NMPM,  NM  Sec. 028 SW, NWSE;  033 N2, SW;  Otero County</p>	<p>LC-3 CSU Off Road Vehicle Use  LC-7 NSO Recreational Opportunities  LC-14 CSU Threatened &amp; Endangered Species Habitat  LC-48 TCP Traditional Cultural Properties  NM-11-LN Cultural Resource Lease Notice  WO-ESA-7 Endangered Species Act Consultation  CSU-200 Meter Buffer Floodplains</p>	<p>680.000</p>

### 3 AFFECTED ENVIRONMENT

This section describes the environment that could be affected by implementation of each of the alternatives described in Chapter 2. The affected environment of the nominated lease parcels are grouped into two categories: Group A and Group B. The categories were developed based on topography, soils and resource values. Group A contains parcels that the BLM is recommending for deferral. Group B contains parcels that are recommended for lease under the Preferred Alternative. The Elements of the affected environment described in this section focus on the relevant resource issues for Group B, while the affected environment description for Group A reveals that more research is needed to give a full account of the resources located within the project boundary. In this chapter, descriptions can be pertinent to Group A or B or both.

The offered lease parcels are located in Otero County, New Mexico. Otero County encompasses nearly 4.3 million acres of which 89% in is public ownership and Tribal lands. The BLM manages 22% of the surface and 36% of the mineral estate in Otero County. The lease parcels are along the Tularosa Watershed and the Tularosa Basin. The Tularosa Watershed drains the Sacramento Mountains to the west, emptying into the closed Tularosa Basin and the small agricultural village of Tularosa. Desert grasslands, Chihuahuan Desert Scrub, and Juniper Savanna are the primary vegetation communities. The lease parcels are found on the basin floor, approximately 4,000 feet in elevation, as well as the flank of the Sacramento Mountain Range, up to approximately 6,000 feet in elevation.

The lease sale parcels are described in the 1986 White Sands RMP.

### 3.1 Air Resources

Air quality and climate are components of air resources which may be affected by BLM applications, activities, and resource management. Therefore, the BLM must consider and analyze the potential effects of BLM and BLM-authorized activities on air resources as part of the planning and decision making process. Much of the information referenced in this section is incorporated from the Air Resources Technical Report for BLM Oil and Gas Development in New Mexico, Kansas, Oklahoma, and Texas (herein referred to as Air Resources Technical Report). This document summarizes the technical information related to air resources and climate change associated with oil and gas development.

#### 3.1.1 Air Quality

The Air Resources Technical Report describes the types of data used for description of the existing conditions of criteria pollutants (USDI BLM 2013), how the criteria pollutants are related to the activities involved in oil and gas development (USDI BLM 2013), and provides a table of current National and state standards. EPA’s Green Book web page (EPA, 2010a) reports that Otero County, where all the proposed leases are located, is in attainment of all National Ambient Air Quality Standards (NAAQS) as defined by the Clean Air Act. The area is also in attainment of all state air quality standards (NMAAQs). There are currently no air quality monitors in Otero County which reflects the fact that there are few major sources of air pollutants. The closest monitor is in Las Cruces, approximately 70 miles west of Tularosa.

#### Current Pollution Concentrations

There is no monitoring conducted for lead, sulfur dioxide and carbon monoxide in the region; however concentrations of these pollutants are expected to be low in rural areas and are therefore not monitored. There is no data for the 1-hour nitrogen dioxide NAAQS due to incomplete data collection.

“Design Concentrations” are the concentrations of air pollution at a specific monitoring site that can be compared to the NAAQS. The 2011 design concentrations of criteria pollutants are listed below.

**Figure 6. 2011 Design Concentrations of Criteria pollutants in Las Cruces, NM (EPA, 2012)**

Pollutant	Design Concentration	Averaging Period	NAAQS	NMAAQs
PM <sub>2.5</sub>	11.9 µg/m <sup>3</sup>	Annual	12.0 µg/m <sup>3,1</sup>	
PM <sub>2.5</sub>	38 µg/m <sup>3</sup>	24-hour	35 µg/m <sup>3,2</sup>	
PM <sub>10</sub>	11 exceedances	24-hour	150 µg/m <sup>3,3</sup>	
O <sub>3</sub>	0.069 ppm	8-hour	0.075 ppm <sup>4</sup>	
NO <sub>2</sub>	8 ppb	Annual	53 ppb <sup>5</sup>	50 ppb
NO <sub>2</sub>	Not Available	1-hour	100 ppb <sup>6</sup>	

<sup>1</sup> Annual mean, averaged over 3 years

<sup>2</sup>98<sup>th</sup> percentile, averaged over 3 years

<sup>3</sup>Not to be exceeded more than once per year on average over 3 years

<sup>4</sup>Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years

<sup>5</sup>Annual Mean

<sup>6</sup>98<sup>98th</sup> percentile, averaged over 3 years

Air quality in a given region can be measured by its Air Quality Index value. The air quality index (AQI) is reported according to a 500-point scale for each of the major criteria air pollutants, with the worst denominator determining the ranking. For example, if an area has a CO value of 132 on a given day and all other pollutants are below 50, the AQI for that day would be 132. The AQI scale breaks down into six categories: good (AQI<50), moderate (50-100), unhealthy for sensitive groups (100-150), unhealthy (>150), very unhealthy and hazardous. The AQI is a national index, the air quality rating and the associated level of health concern is the same everywhere in the country. The AQI is an important indicator for populations sensitive to air quality changes.

Mean AQI values for the region were generally (60% of days) in the moderate range (AQI between 50 and 100) in 2011. Thirty-one percent of days were classified as “good”. During 2011, 19 days were classified as “unhealthy for sensitive groups”, 6 days were classified as “unhealthy” and 7 days were classified as “very unhealthy”. The median AQI was 58 (moderate) and the maximum AQI was 786 (very unhealthy).

Although the AQI in the region has reached the level considered unhealthy and very unhealthy several times in the last decade, there are no patterns or trends to the occurrences (Figure 7).

**Figure 7. Number of Days classified as “unhealthy” or “very unhealthy” in Dona Ana County (AQI >150) (EPA, 2012)**

2002	2003	2004	2005	2006	2007	2008	2009	2010
2	8	7	1	10	3	12	1	5

### 3.1.2 Hazardous Air Pollutants

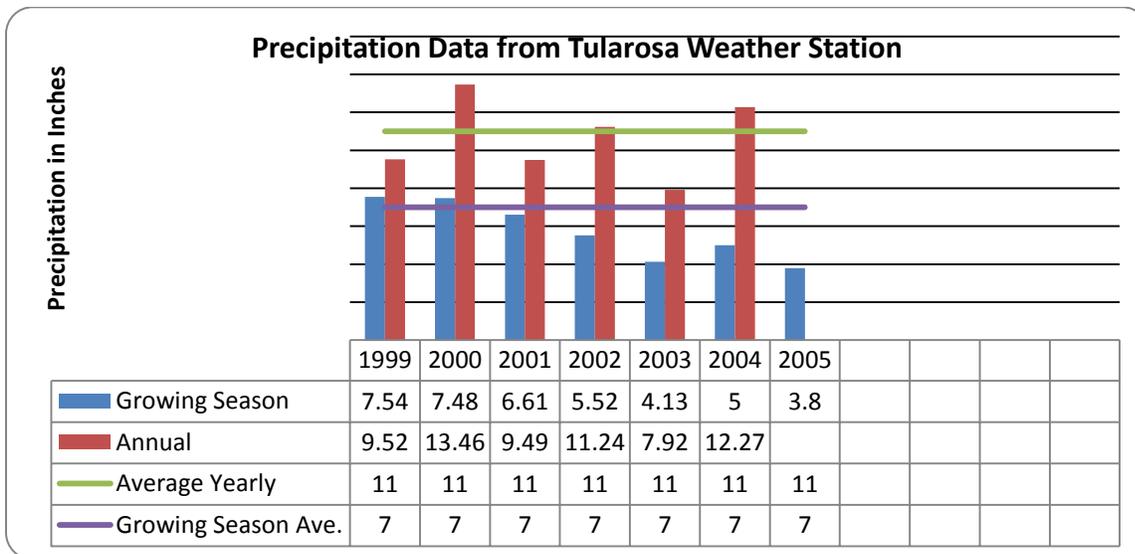
The Air Resources Technical Report discusses the relevance of hazardous air pollutants (HAPs) to oil and gas development and the particular HAPs that are regulated in relation to these activities (USDI BLM 2013). The EPA conducts a periodic National Air Toxics Assessment (NATA) that quantifies HAP emissions by county in the U.S. The purpose of the NATA is to identify areas where HAP emissions result in high health risks and further emissions reduction strategies are necessary. A review of the results of the 2005 NATA shows that cancer, neurological and respiratory risks in Otero County are well below statewide and national levels (EPA, 2011a).

### 3.1.3 Climate

The project area has a climate that is arid to semiarid continental. Average annual precipitation ranges from 8 to 11 inches in the basin and from 12 to 18 inches at the higher elevations. The main source of moisture in the rainy season is moist air from over the Gulf of Mexico in the general circulation about the Bermuda high pressure area, which shifts westward in the summer. Summer monsoon moisture also occurs as a result of northeasterly movement of moist air from the La Niña current off the west coast of Mexico. When the El Niño current prevails in the Pacific Ocean off the west coast of Mexico, monsoonal moisture from both the Pacific and Atlantic oceans is limited. Mountains east of the area receive more precipitation than the basin, somewhat reducing the amount that reaches the Tularosa Basin. About 60 percent of the annual precipitation falls from July to October, most from brief, but sometimes heavy, thunderstorms. There is an average of 45 thunderstorms a year. Prolonged rainy periods are practically unknown, and most of the area is arid. The main source of moisture in the winter is eastward-moving storms over the Pacific Ocean. Much of the moisture in these storms is lost over the mountains west of New Mexico, and winter and spring average one-half inch of rain per month. Precipitation varies greatly from year to year and month to month.

Snow may fall from November through March. Total annual snowfall ranges from 3 to 5 inches in the basin and from 12 to 25 inches at higher elevations. Snow seldom stays on the ground more than a day in the basin. Mean annual temperature ranges from 58 to 62 degrees. Most days from mid-May to mid-September have a temperature of 90 degrees or higher. The average number of days with freezing temperatures range from 80 to 100 per year, mostly between mid-November and mid-March. The freeze free period averages 7 months, from early April to early November (Figure 6).

**Figure 8 Precipitation Data from NOAA Tularosa Weather Station**



The Air Resources Technical Report summarizes information about greenhouse gas emissions from oil and gas development and their effects on national and global climate conditions. While 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.

### **3.2 Areas of Critical Environmental Concern (*applies to Group A*)**

Parcels 26, 31 and 33 are located within the proposed Sacramento Mountain ACEC currently being considered under the TriCounty Draft RMP/EIS. The proposed Sacramento Mountains ACECs met the relevance and importance criteria to be nominated an ACEC. The proposed ACEC would be designated and managed, in part for the protection of special status plant or animal species and ecological resources.

### **3.3 Paleontology**

An internal base-line assessment was conducted to address the potential for significant paleontological resources to be affected by proposed lease sale developments. This assessment was achieved through the application of the Potential Fossil Yield Classification system (PFYC) which provides for the numerical ranking of geological formations in a map overlay format. The overlay for the proposed lease sale area ranks this region as Class 1-3. This designation identifies the presence of fossiliferous geologic formations where fossil content varies in significance, abundance, and predictable occurrences, or where sedimentary rocks are present for which an adequate assessment of fossil potential has not yet been determined. This assessment determines that additional consultation with the Regional Paleontologist or with a qualified specialist may be necessary to evaluate site specific fossil potential and significance.

The following parcels in group A intersect with the PFYC class 3: 9,10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35. Parcel 21, in Group B, also intersects with PFYC class 3. These parcels nominated for lease are wholly or in part underlain by geological formations with a Potential Fossil Yield Classification (PFYC) of 3. A PFYC of three represents management concern for paleontological resources that need to be evaluated on a case-by-case basis for the need to mitigate ground disturbing activities.

There are no documented vertebrate fossil discoveries in the lease area, and few invertebrate locations in the vicinity of the lease parcels. However, the Abo Formation (present in the majority of the PFYC 3 parcels) has proven to be a productive host for a variety of Permian age vertebrate fossils.

### **3.4 Cultural Resources**

The Tularosa Valley has been inhabited for at least 12,000 years, and prehistoric archaeological remains here are included within the Jornada Mogollon cultural region (U.S. Army 2000). This immense span of prehistory is subdivided into three traditions: Paleoindian (ca. 10,000-6000 B.C.), Archaic (ca. 6000 B.C.-A.D. 250) and Formative (ca. A.D. 250-1475). This sequence marks the local development of human societies from highly mobile, hunting-and-gathering peoples who lived in small-scale, informal societies, to farmers who constructed adobe pueblos, maintained more complex societies, and participated in long-distance exchange networks. Following the abandonment of the Tularosa Valley by Formative tradition peoples, nomadic groups re-occupied the area, most significantly the Mescalero Apache, who were present in the area by the seventeenth century, and horse-mounted Comanche, who ranged throughout the area from the 1700s until the mid-nineteenth century (Railey and Holmes 2002:17-67).

The Euro-American history of the region began with the arrival of Spanish explorers in the sixteenth century, although the earliest explorers tended to bypass the Tularosa Valley, traveling along the Rio Grande to the west and the Pecos River to the east. The Spanish began exploiting the natural salt resources in the Tularosa Valley in the 1600s, but the area north of El Paso remained unsettled by Euro-Americans until the late nineteenth century, in part because of threats from the Mescalero Apache and Comanche. Once the threat of raiding had subsided, ranching quickly expanded into the Tularosa Valley, and the 1880s saw a cattle boom there. Mining activity also began to flourish in the area in the late

nineteenth century, and irrigation-based farms sprang up along the eastern margin of the valley. With the construction of the El Paso and Northeastern Railroad in 1897-1898, economic development and population growth increased rapidly, and the City of Alamogordo was founded. In the twentieth century, ranching activities diminished as the environment was degraded by over-grazing, and mining activities dissipated as mineral resources played out or failed to deliver on initial production promises and hopes. During this same century, however, the expansion of the Fort Bliss Military Reservation and establishment of the WSMR refocused much of Alamogordo's economy on military-related activities and support services, and these remain important sources of livelihood in the area (Railey and Holmes 2002:67-78).

### 3.5 Environmental Justice

Federal agencies are required to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in accordance with NEPA, Executive Order 12898: *Environmental Justice*, and other applicable laws and regulations. In this section, the presence of minority and low-income populations within the area of the nominated lease parcels was assessed for Otero County. For purposes of the *lease sale EA*, minority populations and low-income populations are defined as follows:

- Minority populations are persons of Hispanic or Latino origin of any race, African Americans, American Indian/Alaska Natives, and Asians or Pacific Islanders (without double-counting persons of Hispanic/Latino origin who are also identified as part of minority racial groups).
- Low-income populations are persons living below the poverty level. The U.S. Census Bureau uses a set of income thresholds that vary by family size and composition to determine who is poor. Based on this, the poverty level for a family of four in 2002 having two children under the age of 18 was \$18,244 (U.S. Census Bureau 2003). U.S. Census Bureau 2000 data, however, is based on 1999 data, when the poverty level for the same family was \$16,895 (U.S. Census Bureau 2002).

To determine whether minority and low-income populations occur disproportionately within the larger population, the percentage of minority and low-income residents within each geographic unit is compared against (1) 50 percent of the population in the three-county area, or whether the majority of the population consists of minority or low-income people and (2) the state percentage. Results of this analysis are summarized in Table 3-51.

The majority of New Mexico's population (54 percent) is part of a minority group. Figure 7 indicates that Otero County exceeded the State of New Mexico's minority population proportion (U.S. Census Bureau 2000). The only geographic area that did not exceed the statewide poverty rate was the City of Alamogordo.

**Figure 9 Data for Otero County and Alamogordo Minority and Low Income Populations.**

MINORITY AND LOW-INCOME POPULATIONS (2000) <sup>1</sup>						
Geographic Area	Percent of Minority Residents	Above 50 Percent	Above 54 Percent	Poverty Rate <sup>2</sup> (Percent)	Poverty Rate Below 50 Percent	Poverty Rate Below 18 Percent
Otero County	28	No	No	21	No	Yes
Alamogordo	10	No	No	17	No	No
SOURCE: U.S. Census Bureau 2000						

NOTES: <sup>1</sup>New Mexico comparison population: Minority Population = 54 percent, Low-Income Population = 18 percent <sup>2</sup>Poverty rate among individuals, based on poverty status in 1999.

### 3.6 Invasive, Non-native Species

Once the decision is made by the lessee to develop a lease, an area specific Invasive and Non- native species (Weed) inventory review will 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. There are no known populations of invasive or non-native species within the proposed parcels

### 3.7 Special Status Species

#### 3.7.1 Special Status Plant Species

Presence of special status plant species and their habitats in Otero County was considered using LCDO species occurrence/habitat records and New Mexico Natural Heritage Program species records. Species descriptions and distributions were derived from LCDO office records and New Mexico Rare Plant Technical Council [NMRPTC. 1999. New Mexico Rare Plants. Albuquerque, NM: New Mexico Rare Plants Home Page. <http://nmrareplants.unm.edu> (Latest update: 18 January 2006)]. Based on evaluation of the above information, of the 40 special status plant species known to occur in Otero County, twelve species and/or habitats could occur in the proposed lease parcels and are listed in Figure 8.

**Figure 10 Special Status Plant Species expected in the proposed lease parcels**

Species	Status
Alamo beardtongue	BLM and USFS Sensitive, State and USFWS Species of Concern
Arizona crested coralroot	State Endangered, USFWS and USFS Species of Concern
Chapline's columbine	
Cliff nama	State and USFWS Species of Concern
Gray sibara	BLM Special Status, State and USFWS Species of Concern
Hairy muhly	State and USFWS Species of Concern
Mescalero pennyroyal	State, USFWS Species of Concern
New Mexico rock daisy	BLM Special Status, State and USFWS Species of Concern
Todsen's Pennyroyal	Federally Endangered, State Endangered
Villard pincushion cactus	State Endangered, BLM Special Status, USFWS Species of Concern
Wooton's wild buckwheat	USFWS, State Species of Concern
Wright's marsh thistle	State Endangered, USFWS Species of Concern

**Alamo beardtongue** (*Penstemon alamosensis*) This perennial forb grows in sheltered rocky areas, canyon sides, and canyon bottoms, on limestone between 4,300 and 5,300 feet elevation.

**Arizona crested coralroot** (*Hexalectris spicata* variety *arizonica*) This orchid grows in heavy leaf litter in oak, pine, or juniper woodlands over limestone.

**Chapline’s columbine** (*Aquilegia chaplinei*) This perennial herb grows in limestone seeps and springs and riparian areas in montane scrub and canyon bottoms from 4,700’ to 5,500’.

**Cliff nama** (*Nama xylopodum*) This herbaceous perennial grows in partly shaded limestone cliffs in mountain shrub and pinyon-juniper habitats from 4,500 to 6,500 feet elevation.

**Gray Sibara** (*Sibara grisea*) This annual forb grows in crevices and limestone cliffs in shrubby and pinion-Juniper habitats from 4,500-6,000 feet. Livestock grazing is not believed to be a threat to this species.

**Hairy muhly** (*Muhlenbergia villiflora* variety *villosa*) This rhizomatous perennial grass grows in open desert grassland in alkaline to calcareous soils from 4,800 to 5,200 feet elevation.

**Mescalero pennyroyal** (*Hedeoma pulcherrimum*) This perennial forb grows on steep hillsides in pinion-juniper and conifer forests from 5,000 to 9,000 feet elevation.

**New Mexico rock daisy** (*Perityle staurophylla* variety *staurophylla*) This perennial forb grows in crevices in limestone cliffs and boulders, usually on protected north and east exposures, from 4,900 to 7,000 feet.

**Todsen’s Pennyroyal** (*Hedeome todsenii*) This perennial forb grows in loose, gypsiferous limestone soil of the Permian Yeso formation on steep north or east-facing slopes in Pinyon-Juniper woodland from 6,200 to 7,400 feet

**Villard pincushion cactus** (*Escobaria villardii*) This small cactus grows in loamy soils in desert grass/shrub types on limestone benches from 4,500 to 6,500 feet elevation.

**Wooton’s wild buckwheat** (*Eriogonum wootonii*) This perennial forb grows on mountain slopes and in forest openings from 6,000 to 11,500 feet

**Wright’s marsh thistle** (*Cirsium wrightii*) This biennial to perennial forb grows in wet, alkaline spoils in spring seeps from 3,450 to 8,500 feet elevation.

### 3.7.2 Special Status Animal Species

Special Status animal species lists for Otero County were compiled from: ([www.wildlife.state.nm.us/conservation/threatened\\_endangered\\_species/index.htm](http://www.wildlife.state.nm.us/conservation/threatened_endangered_species/index.htm) and [http://www.fws.gov/southwest/es/newmexico/SBC\\_view.cfm?spcnty=Otero](http://www.fws.gov/southwest/es/newmexico/SBC_view.cfm?spcnty=Otero) . These lists are on file in the Las Cruces District Office.

Known geographic distribution and habitat requirements were considered for each species in comparison with habitat types on the proposed lease parcels. The results of this analysis are that of the species listed by the FWS as species of concern or by the BLM as Sensitive species in Otero County, 19 species are considered to have potential habitat within these allotments, these species are listed in Figure 9.

**Figure 11 Special Status Wildlife Species**

Species	Status
Ferruginous hawk	BLMS
Aplomado falcon	FP

Common ground dove	NME
Loggerhead shrike	BLMS, FWSS
Burrowing owl	BLMS, FWSS
Gray vireo	NMT
Baird's sparrow	NMT, BLMS, FWSS
Piñon jay	BLMS
Texas horned lizard	BLMS
Meadow jumping mouse	BLMS
Western small-footed myotis	BLMS
Cave myotis	BLMS
Long-eared myotis	BLMS
Long-legged myotis	BLMS
Fringed myotis	BLMS
Spotted bat	NMT, BLMS, FWSS
Townsend's big-eared bat	BLMS, FWSS
Big free-tailed bat	BLMS
Western red bat	BLMS
FT=FEDERAL THREATENED, FWSS=NEW MEXICO SPECIES OF CONCERN, NMT=NEW MEXICO THREATENED, NME=NEW MEXICO ENDANGERED, FP=FED. PROPOSED, BLMS=BLM SENSITIVE, FE=FEDERAL ENDANGERED	

Habitat descriptions for these special status wildlife species are available from the Bureau of Land Management, Las Cruces District Office.

### 3.8 Wastes, Hazardous or Solid

The Resource Conservation and Recovery Act (RCRA) of 1976 established a comprehensive program for managing hazardous wastes from the time they are produced until their disposal. The EPA regulations define solid wastes as any "discarded materials" subject to a number of exclusions. On January 6, 1988, EPA determined that oil and gas exploration, development and production wastes would not be regulated as hazardous wastes under RCRA. The Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980, deals with the release (spillage, leaking, dumping, accumulation, etc.), or threat of a release of hazardous substances into the environment. Despite many oil and gas constituent wastes being exempt from hazardous waste regulations, certain RCRA exempt contaminants could be subject to regulations as hazardous substances under CERCLA.

No hazardous or solid waste materials are known to be present on any of the proposed lease parcels.

### 3.9 General Topography/Surface Geology

The western portion of the project area is generally flat land in the Tularosa Basin, between 3,623 and 5,000 feet in elevation. The eastern portion of the project area is more mountainous with peaks at 6,000 to 7,450 feet. The parcels in Group B, (not deferred) vary from Group A (deferred) in rock and soil texture and composition. Horizontal strata of the leasable areas have small mountains, plateau escarpments and other topographical features that are etched out by weathering. Topographic details of land in this lease sale are dependent upon differences in rock structure, texture, and altitude that give rise to prominences of semi-arid desert type surface features. Parcels in Group A are generally steeper, hilly,

highly erodible, and dissected by arroyos and drainages. Parcels in Group B are generally flat lowlands with little relief.

### **3.10 Soil**

The Soil Survey of Otero County, New Mexico, (USDA -Soil Conservation Service 1981) was used to describe and analyze impacts to soil from this proposed action. The Otero area is generally flat land in the Tularosa Basin, between 3,623 and 5,000 feet in elevation, and the low mountains in the southeastern part with peaks at 6,000 to 7,450 feet. The climate is arid to semiarid continental. Average annual precipitation ranges from 8 to 11 inches in the basin and from 12 to 18 inches at higher elevations. Mean annual temperatures ranges from 58 to 62 degrees.

Group B soils: The majority of the soil map units represented in the group B area are gypsiferous soils and are: Alamogordo-Gypsum land complex, 0 to 5 percent slopes (AEC). Prelo silt loam, 0 to 3 percent slopes (POB) Holloman-Gypsum land-Yesum complex, 0 to 5 percent slopes (HOB). Prelo sandy loam, hummocky, 0 to 1 percent slope (PkA). Prelo fine sandy loam, 0 to 1 percent slope (PLA). Prelo silt loam, 0 to 1 percent slope (PmA). Torrifluent, Hummocky, 0 to 1 percent slope (TvA). Alamogordo-Aztec complex, 1 to 3 percent slope (AdB). Complete descriptions of these soils have been compiled by the NRCS, and can be found at their website, <http://websoilsurvey.nrcs.usda.gov/app/>

Group A soils: This group has soils that are so intermingled that in many cases could not be separated. The landscape is either steep or located on side slopes of pediments that have been dissected by many deep, narrow drainage ways. The majority of the soil map units represented in the group A area are gypsiferous soils and are: Alamogordo - Gypsum land-Aztec complex, 15 to 50 percent slopes (AGE). This complex consists of areas of deep, well drained soils and areas of exposed gypsum. The landscape is mainly severely dissected, partially truncated side slope of pediments. Aztec - Rock outcrop-Lozier complex, 20 to 65 percent slopes (AZF). This complex consists of areas of deep and shallow, well drained soils and limestone outcrop. These areas are so intermingled that they could not be separated on the low detail map. The landscape is steep, limestone-controlled side slopes, hill crests, and ridges on the west face of mountain escarpments. Pena-Aztec Variant association, strongly sloping (PAE). This association consists of areas of deep, well drained soils. These soils occur on side slopes of pediments that have been dissected by many deep, narrow drainage ways. Deama-Rock outcrop-Holloman Variant complex, 15 to 65 percent slopes (DSF). This map unit is shallow, well drained, and nearly level to very steep soils on limestone hills and mountains, rock outcrop. The Deama soils are mixed with the Rock outcrop on uplands. Pena-Aztec Variant association, strongly sloping (PAE). This association consists of areas of deep, well drained soils. These soils occur in a regular and repeating pattern mainly on side slopes of pediments that have been dissected by many deep, narrow drainage ways. Other soils are: Alamogordo-Gypsum land complex (AGE). McCullough sandy loam (McB). Aztec-Rock outcrop-Lozier complex, 20 to 65 percent slope (AZF). Deama-Rock outcrop-Holloman Variant complex, 15 to 65 percent slope (DSF). Badland (BAF) this map unit encompasses large area in this group. Complete descriptions of these soils have been compiled by the NRCS, and can be found at their website, <http://websoilsurvey.nrcs.usda.gov/app/>

### **3.11 Water Resources**

#### **3.11.1 Wetlands and Floodplains**

Several of lease parcels are located in the 100-year floodplain. For administrative purposes, the 100-year floodplain serves as the basis for floodplain management on public lands. It is based on Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency (1983) which describes a “Zone A” as the “Area of the 100-year flood.” Current development on the floodplain consists of two-track roads and several miles of boundary fence in the area. The following table describes the acreage of Zone A areas within each parcel (Figure 10).

**Figure 12 Zone A of the 100 year flood (FEMA 1983).**

Lease Parcel #	17	19	20	21
Acres in Zone A	23	10	185	16

### 3.11.2 Water Quality – Surface/Ground

In reports submitted by the NM Water Quality Control Commission (NMWQCC) to Congress, as required by Section 305(b) of the CWA, 10.2 miles of the Tularosa Creek from the town of Tularosa to the headwaters are assessed. Tularosa Creek is a stream that has been listed as impaired on the State of New Mexico CWA Sections 303(d)/305(b) Integrated List (Integrated List). Several assessments of the creek have been completed since 1994. Primarily, analysis has classified the creek as “Partially Supporting” or “Not Supporting Designated Uses”. The Designated uses not supported have included warm water fisheries and cold water fisheries. Aluminum and mercury were listed as toxic at chronic levels in 1994. Since 1994, additional probable causes for these impairments have included sedimentation, aluminum, mercury, removal of riparian vegetation, and stream bank modification and destabilization. BLM is awaiting the results of the most current 2012-2014 State of New Mexico CWA 303(d)/305(b) Integrated List (Integrated List). The water quality of springs and seeps in the area can range from fresh to brackish suggesting variable geology, aquifers, water mixing zones, water source, or a combination of these. Additional water quality information for the springs is unknown at this time.

Groundwater quantity and quality within this area varies both laterally and vertically; and is largely controlled by type and extent of the underlying geologic formations and basin-fill deposits. Varying salinities of the groundwater is primarily due to soluble minerals in the aquifer sediments, recharge from surface water, and groundwater flowing through sedimentary rocks rich in sulfate materials. The quality of existing water resources for the City ranges from about 300 mg/L TDS from Bonito Lake to as much as 1,400 mg/L TDS from groundwater pumped from the La Luz well field (Livingston 2003b). The average TDS value of water in the distribution system is around 800 mg/L in the wintertime, rising to about 1,100 mg/L during the summer months when the wells are being pumped extensively.

### 3.11.3 Watershed

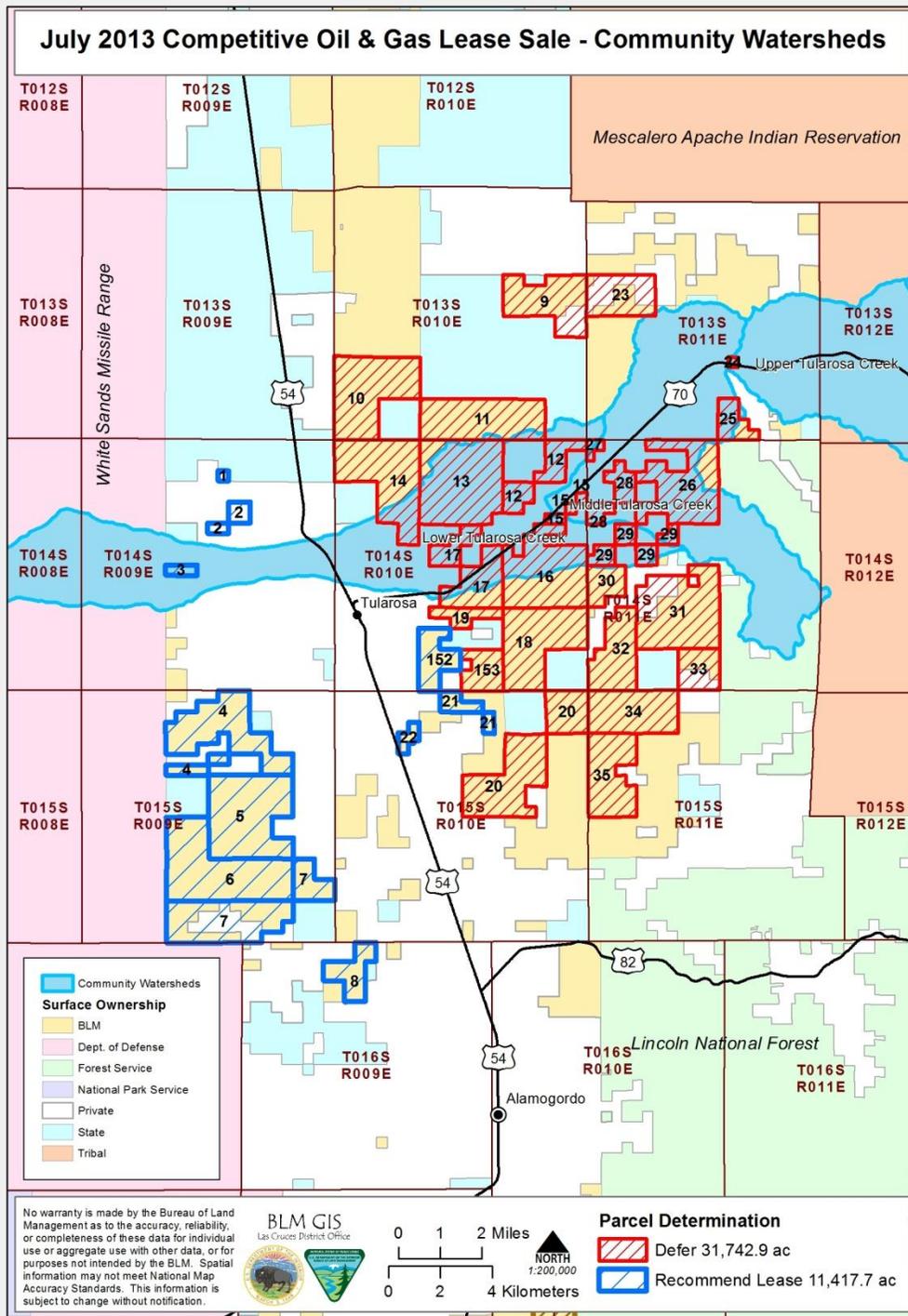
Tularosa Creek originates from two major drainages on the Mescalero Apache reservation and flows westward joining near the community of Mescalero, and then continues westward for approximately 16 miles. Tularosa creek passes through the community of Bent and the Village of Tularosa before infiltrating into playas in the Tularosa basin (Figure 10a). Major uses in the Tularosa creek watershed include irrigated agriculture, the primary municipal water supply for the Village of Tularosa, livestock grazing, timber production and harvesting, recreation and urban development. The Tularosa Creek HUC

10 watershed encompasses around 114,298 acres. BLM controls approximately 12,300 surfaces acres within this watershed. The Village of Tularosa and the City of Alamogordo have historically relied on existing surface water flowing from the perennial streams of the Sacramento Mountains. The communities have had to look to groundwater for future water supplies. The USGS stream-gauging records for Tularosa Creek over the past 10 years indicate a 30 percent decline in discharge (USGS 2005). The Tularosa Creek stream bed and associated floodplains has been eroded approximately 3-12 feet below the original grade. Judging by the dominate age of cottonwood trees present on the current floodplain of the creek, it is inferred that the majority of this erosion has occurred within the past 15-30 years. Currently, man-made structures such as bridge foundations, fish habitat structures, and stream gauge dams act as gradient stabilization structures along the BLM portion of the Tularosa Creek. These structures help to slow further down-cutting of the stream bed. Additionally, tributaries of the Tularosa Creek and others adjacent to the Tularosa Creek watershed within the project area display equal amounts of erosion and down-cutting. These erosion features of the watershed is most likely attributed to easily eroded soils, slope of topography, and a substantial drop in the shallow groundwater table. Erosion of this magnitude has reduced groundwater recharge, segregated overland water flow and increased sediment transport. Several spring fed riparian zones occur within Group A.

Group B parcels almost dominantly occur on slopes less than 5%. Parcels located on the west side of HWY 54 are dissected by wide mature flat drainages that flow south-southwest toward the gypsum dune field and small playas. However, a large percent of these mature drainages contain varying amounts of excessive erosion within the main drainage channels. Parcels located on the east side of HWY 54 are also dissected by arroyos and gullies. The larger arroyos are generally well defined with steep banks and display excessive erosion features. Additionally, immature well-defined gullies can be present inferring a relatively recent mobilization of soils and channelized flows. Erosion on these parcels is likely enhanced from high flows draining from the steeper slopes to the east.

The basin-fill deposits represent the most productive aquifers in the area in terms of the quantity of water available, achievable production rates, and degree of historic development. Groundwater in the basin-fill aquifers generally originates in the mountains as precipitation then moves into coarser material in the basin. The project area likely contains multiple vertically stack aquifers separated by less permeable confining layers. Basin-fill deposits are typically thicker and have higher water holding capacities toward the center of the basin.

Figure 10a. Community Watershed intersecting with nominated lease parcels.



### 3.12 Vegetation

Group A Vegetation Types are Creosote, Mesquite, Mid Grass, Mixed Desert Shrub, Mixed Mountain Shrub, and Piñon-Juniper. Group B Vegetation Types are creosote, fourwind saltbush, mesquite, and mixed desert shrub. These ecological sites are located within the Southern Desertic Basins, Plains, and Mountains (number 42) Major Land Resource Area, and SD-2 sub-resource area. Complete descriptions can be found on the NRCS website, <http://www.nm.nrcs.usda.gov/technical/fotg/section-2/esd.html>

### 3.13 Livestock Grazing

The parcels proposed in this lease sale cover portions of 17 grazing allotments (Figures 11 and 11a). These allotments are authorized for yearlong grazing and are generally cow/calf operations. The 17 grazing allotments are as follows:

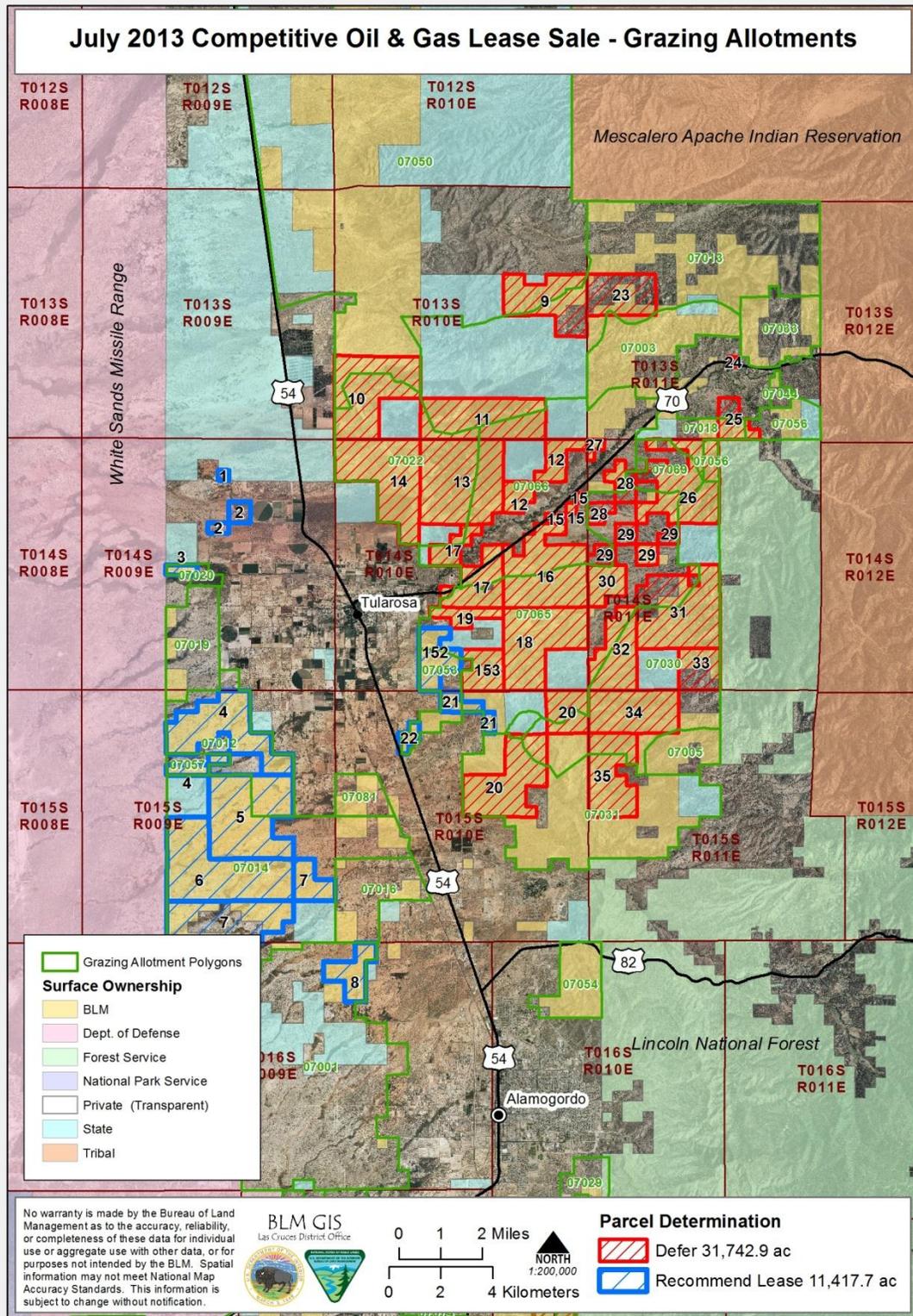
**Figure 13 Grazing Allotments within the proposed Lease Sale Parcels**

Group A		Group B	
Allotment No	Allotment Name	Allotment No.	Allotment Name
07005	Upper Labrocita	07001	HIC Ranch Lease
07013	Apache	07012	Reagan Draw
07018	Fletcher Spring	07014	Malone Draw
07022	Salado Creek	07016	La Luz Canyon
07030	Domingo Springs Ranch	07020	Tularosa Creek Lease
07031	Laborcita	07050	Not Permitted
07050	Black Ledge	07053	Not permitted
07053	Not permitted	07057	Mesquite Spring
07056	Nogal Canyon		
07065	Domingo Spring		
07066	Tecolote Canyon		

Range monitoring plots are associated with parcel NM-201307-006 within allotment number 07014, parcel NM-201307-034 within allotment number 07030, parcel NM-201207-016 within allotment number 07066, parcel NM-2012-017 within allotment numbers 07066 and 07065, and parcel NM-201207-012 within allotment number 07066. Mitigation is included in reference to any possible impacts to these BLM study areas. All of these proposed lease sale parcels contain range improvements that may include vegetation treatments, fences, pipelines, water troughs and/or storage tanks.

The overlap of livestock grazing allotments with dominated lease parcels is depicted in Figure 11a.

Figure 11a. Grazing allotments in the July 2013 Lease Sale parcels.



## 3.14 Wildlife and Fisheries

### 3.14.1 Wildlife Habitat

The distribution and quality of wildlife habitats in this area reflects impacts from many decades of livestock grazing. As a result, the existing abundance and distribution of wildlife species reflects the capability of habitats in these allotments to support wildlife on a grazed landscape.

The BLM conducted an inventory of wildlife habitats on these allotments using the Integrated Habitat Inventory and Classification System (IHICS) in 1982. Standard Habitat Sites (SHS) occurring in the proposed lease sale parcels as of 1982 include:

- Creosote Rolling Upland
- Creosote Hill
- Mesquite Rolling Upland
- Grass Flat
- Grass Rolling Upland
- Grass Hill
- Grass Mountain
- Mixed Shrub Rolling Upland
- Mixed Shrub Mountain
- Pinyon-Juniper/Grass Mountain
- Pseudoriparian (Arroyo)
- Riparian

Standard Habitat Site descriptions can be found starting on page 3-21 of the White Sands Resource Area Draft Resource Management Plan/Environmental Impact Statement (1986). These Standard Habitat Sites provide habitat for approximately eight species of amphibians, 41 species of reptiles, 55 species of mammals, and 140 species of birds. Tables of wildlife found in Otero County, by habitat type, are available from the Bureau of Land Management, Las Cruces District Office.

### 3.14.2 Fisheries and Aquatic Habitats

Tularosa Creek is a small to moderate size stream (avg. 14cfs) flowing from two springs on the Mescalero Indian Reservation. It flows down the west slope of the Sacramento Mountains through the proposed action area. BLM lands cover approximately 1.5 miles of stream starting near Bent, NM, under HWY 70 and ending approximately above the bridge at Gato Road. HWY 70 makes a man-made break in the stream thus creating upper and lower reaches. The stream begins as a G3c Rosgen type stream (Rosgen 1996) with a slope of less than 2%. It then, accordingly drops to a G3-G4 (Rosgen 1996) as the slope increases above 2%. The head-cut begins upstream of public lands and becomes more severe as the stream flows downhill. The upper reach is more sinuous and has a flatter slope than the lower reach. The stream has a diverse and rich riparian vegetation community. The floodplain is small and immature throughout most of the stream.

The fishes of Tularosa Creek include native fish (e.g. longnose dace and others) and non-native, introduced sport fish such as brown and rainbow trout (Sublette, et. Al. 1990). Aquatic and riparian invertebrate species are unknown at this time, but a study is underway to characterize the community. A thorough understanding of the distribution of riparian vegetation and other flora and fauna of the riparian zone are unknown at this time. Further studies need to be instituted in order to characterize the riparian zone assemblage. Known riparian areas are depicted below in Figure 12.

In addition, given that Tularosa Creek has been disconnected from any other stream system for millendnia, there may be a taxonomically distinct population segment or more importantly, a new sub-species of Rio Grande sucker (*Catostomus plebeius*) in the creek. If either is found it is possible the population may become a BLM sensitive, a state listed species and possibly a federally listed species, as well. Without further surveys and genetic and morphological analysis it is unknown if this is the case.

However, morphological and genetic analysis will take at minimum 1-2 years to be performed as to date there are no known captured individuals from Tularosa Creek.

Installation of fish and in-stream structures has been underway for several years and will continue. The structures create fish and invertebrate habitat such as resting and rearing habitat as well as gravels for reproduction for the fishes. The structures have also captured copious amounts of sediment deposited in the stream from the uplands surrounding Tularosa Creek, promoting stream recovery and repair. The stream is downcut along most its water course, but by instituting a program of installation of in-stream structures, water quality has and will continue to improve.

Aquatic and terrestrial invertebrate species diversity in Tularosa Creek is generally poorly understood but a study of the aquatic invertebrates of Tularosa Creek is underway and will take approximately one year to complete. Results of this study are intended to improve our management of the important aquatic resources associated with this watershed.

### **3.15 Visual Resources**

Visual Resource Management (VRM) on public land is conducted in accordance with BLM Handbook 8410 and BLM Manual 8411. Visual Resource Management (VRM) classes are used as minimum management objectives for identified visual management units. Each VRM class describes differing degrees of modification allowable in basic landscape elements. The primary character of the landscape will be retained regardless of the degree of modification. Class II management objectives are to retain the existing character of the landscape, where the level of change should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features characteristic of the landscape. The VRM Class III objective is to partially retain the existing character of the landscape. 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. VRM Class IV objective is to provide for management activities which allow 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.

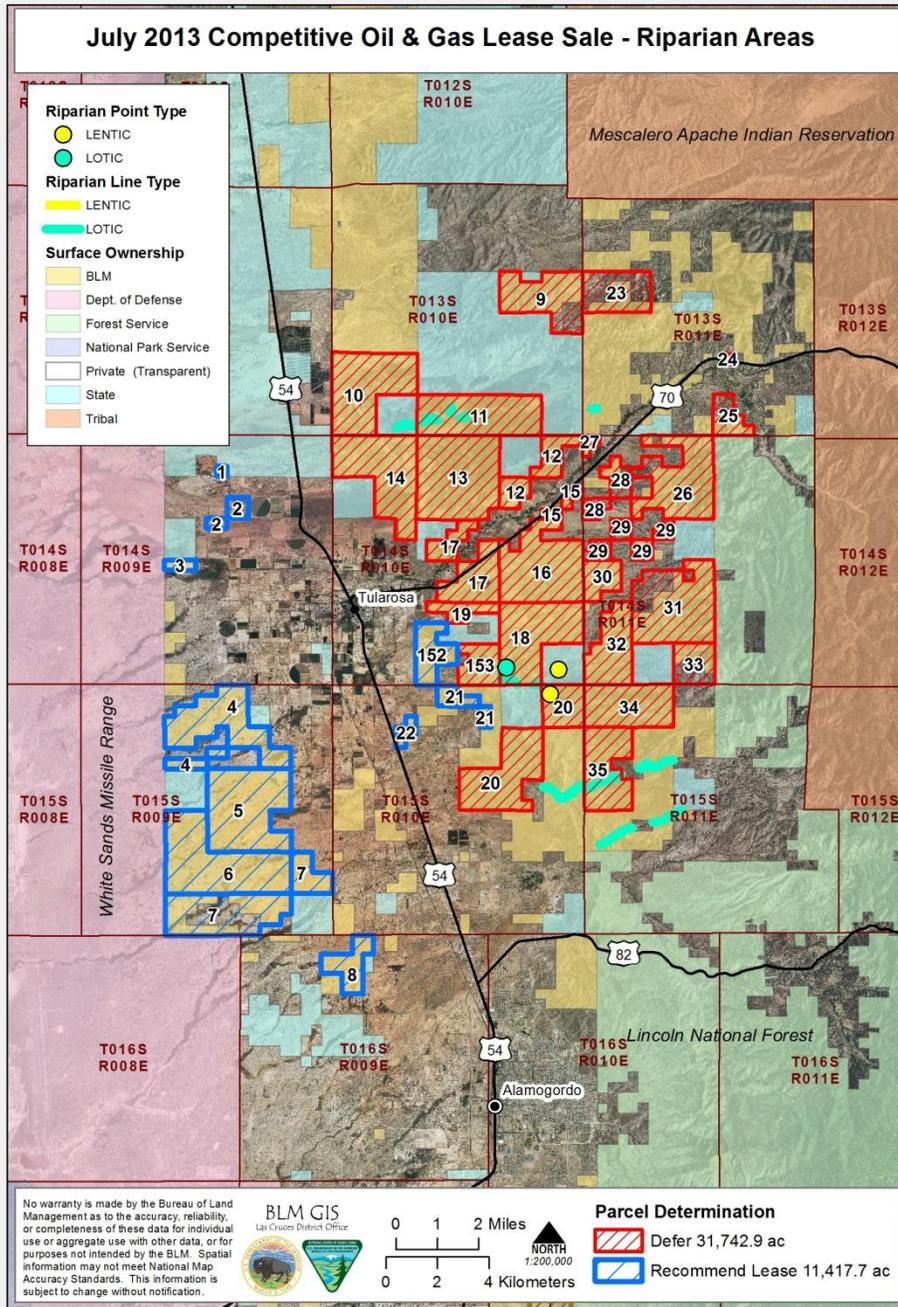
The VRM ratings found within Group A are Class II and III. The VRM ratings found within Group B are Class III and VI.

### **3.16 Recreation**

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.

Tularosa Creek is a riparian area with aquatic resources would be primarily managed for dispersed recreation activities. Approximately 120 acres along Tularosa Creek are identified in the White Sands RMP as a recreation area. In the forthcoming TriCounty RMP, 230 acres in the same vicinity are analyzed as a Special Recreation Management Area.

Figure 14 Known distribution of riparian habitats in the project area.



### **3.17 Lands & Realty**

Most of the nominated lease areas are accessible by existing roads. However, legal access for some roads may not exist. There are several existing ROWs on some of the nominated parcels, including powerlines, roads, and gas pipelines.

### **3.18 Cave/Karst**

Karst refers to a geomorphic landscape created by the dissolution of a layer or layers of soluble bedrock; usually carbonate rock such as limestone. Characteristic landforms in karst regions can include caves, springs, sinkholes, blind valleys, disappearing streams and cenotes. In New Mexico, karst landforms are most commonly associated with near-surface outcrops of limestone, dolomite or other soluble sedimentary rocks. Geologic mapping of the subject parcels (Scholle, 2003) indicates that undifferentiated Pennsylvanian-Permian carbonate bedrock outcrops in limited portions (500 acres or less) of nominated parcels 20 and 21. The potential for karst resources is considered low; however, field verification may be necessary for specific surface disturbing proposals.

## **4 ENVIRONMENTAL IMPACTS**

### **Environmental Consequences and Proposed Mitigation Measures**

#### **4.1 Assumptions for Analysis**

The analysis grouped the nominated parcels into two categories: Group A and Group B. These categories were developed based on a review of the resource-related issues for all nominated parcels. These resources include sensitive and erosive soils, critical community watersheds, riparian areas, steep topography, impacts to special status species and their habitats, springs and seeps, and impacts to the proposed Sacramento Mountains ACEC. Group A (parcels with unresolved issues) contains the following parcels: 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, and 153. Group B (parcels preliminarily identified as available for lease) contains the following parcels: 1, 2, 3, 4, 5, 6, 7, 8, 21, 22, and 154. The act of leasing parcels would, by itself, have no impact on any resources in the LCDO. 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 5 years and long-term impacts are those that would substantially remain for more than 5 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.

Development in the LCDO has mostly been exploratory in nature. However estimates of total surface disturbance for this lease sale action are based on full field development. Based upon the nominated 43,160 acres with a 40 acre spacing per well and well pad, an estimated total of potentially 1,079 wells

could be developed assuming full field development of every spacing unit having 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 offered are not within or near well-developed fields. Surface disturbance assumptions shown in the following paragraph are examples of possible 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 per well**

## **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 land to be drained by wells on adjacent private or state land. 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 its leasing decisions and potential development of those minerals, the assumption is that the public's demand for the resource would not be expected to change. Instead, the resource foregone 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 Proposed Action Alternative**

### **4.3.1 Air Resources**

Potential impacts of development of the proposed lease could include increased air borne soil particles blown from new well pads or roads, exhaust emissions from drilling equipment, compressors engines, vehicles, flares, and dehydration and separation facilities, and volatile organic compounds during drilling or production activities.

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

The second phase of the well begins after the well is completed and is put on line for production. Emissions during the production phase may include vehicle traffic, engines to pump oil if necessary, compressor engines to move gas through a pipeline, venting from storage tanks, and storage tank heaters. A work-over of the well may occasionally be required, but the frequency of work-overs is not predictable. The final phase is to plug and abandon the well and rehab the pad.

**Potential Mitigation:** The BLM encourages industry to incorporate and implement “Best Management Practices” (BMPs) and following the BLM-Gold Book, which are designed to reduce impacts to air quality by reducing emissions, surface disturbances, and dust from field production and operations. Typical measures include: adhere to BLM’s Notice to Lessees’ (NTL) 4(a) concerning 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; co-locate wells and production facilities to reduce new surface disturbance; implement directional drilling and horizontal completion technologies whereby one well provides access to petroleum resources that would normally require the drilling of several vertical wellbores; require that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored; and perform interim reclamation to re-vegetate areas of the pad not required for production facilities and to reduce the amount of dust from the pads.

An application for permit to drill (APD) is required for each proposed well to develop a lease. Onshore Oil and Gas Order No. 1 issued under 43 CFR 3160 authorizes BLM to attach Conditions of Approval (COA) to APDs during permitting. Additional analysis will be done at such time as an APD is requested and a determination will be made on the need for mitigation based on the estimated level of emissions.

#### 4.3.2 Greenhouse Gases

Information about (GHGs) and their effects on national and global climate is presented in the Air Resources Technical Report (USDI BLM 2013). Only the GHG emissions associated with exploration and production of oil and gas will be evaluated here because the environmental impacts of GHG emissions from oil and gas consumption, such as refining and emissions from consumer-vehicles, are not effects of the proposed action as defined by the Council on Environmental Quality because they do not occur at the same time and place as the action. Thus, GHG emissions from consumption of oil and gas do not constitute a direct effect that is analyzed under NEPA. Nor is consumption an indirect effect of oil and gas production because production is not a proximate cause of GHG emissions resulting from consumption. However, emissions from consumption and other activities are accounted for in the cumulative effects analysis.

The two primary GHGs associated with the oil and gas industry are carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>). Because methane has a global warming potential that is 21-25 times greater than the warming potential of CO<sub>2</sub>, the EPA uses measures of CO<sub>2</sub> equivalent (CO<sub>2</sub>e) which takes the difference in warming potential into account for reporting greenhouse gas emissions. Emissions will be expressed in metric tons of CO<sub>2</sub> equivalent in this document.

Oil and Gas production in New Mexico is concentrated in the San Juan Basin and 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 2010 are shown in Figure 12 for the US, New Mexico and for wells on federal leases in each basin while Figure 14 shows an estimate of greenhouse gas emissions for oil and gas field production based on the assumption that emission are proportional to production. There are currently no producing wells in Otero County, therefore it is impossible to quantify emissions based on potential production but it can be concluded that

any GHG emissions would be very small compared to the more active production areas in New Mexico which each account for only 0.01% of US GHG emissions.

Because oil and gas leaves the custody and jurisdiction of the BLM after the production phase and before processing or refining, only emissions from the production phases are considered here. It should also be remembered that following EPA protocols, these numbers do not include fossil fuel combustion which would include such things as truck traffic, pumping jack engines, compressor engines and drill rig engines. Nor does it include emissions from power plants that generate the electricity used at well sites and facilities. Note that units of metric tons CO<sub>2</sub>e have been used in Figure 13 to avoid very small numbers. For comparison one million metric tons is equal to one teragram.

**Figure 15 2010 Oil and Gas Production**

	Oil Barrels (bbl.)	% U.S. Total	Gas (MMcf)	% U.S. Total
United States	1,999,731,000	100	26,836,353	100
New Mexico	65,380,000	3.27	1,341,475	5.00
Federal leases in New Mexico	31,533,000	1.58	824,665	3.07
San Juan Basin	1,468,000	0.07	630,060	2.35
Permian Basin	30,065,000	1.5	194,065	0.73

**Figure 16 2008 Oil and Gas Field Production Emissions**

(Metric Tons CO <sub>2</sub> e)	Oil		Gas		Total O&G Production	%U.S. Total GHG emissions
	CO <sub>2</sub>	CH <sub>4</sub>	CO <sub>2</sub>	CH <sub>4</sub>		
United States	300,000	30,600,000	10,800,000	126,000,000	167,700,000	2.6
New Mexico	9,810	1,000,620	540,000	6,300,000	7,850,430	0.12
Federal leases in New Mexico	4,740	483,480	331,560	3,868,200	4,687,980	0.07
San Juan Basin	210	21,420	253,800	2,961,000	3,236,430	0.05
Permian Basin	4,500	459,000	78,840	919,800	1,462,140	0.03

Figure 14 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 GHGs from the life cycle of oil and gas. For example, acquisition (drilling and development) of petroleum is responsible for only 8% of the total lifecycle GHG 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).

**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<sub>2</sub> and CH<sub>4</sub> emissions (natural gas and petroleum systems do not produce noteworthy amounts of any of the other greenhouse gases). Within the

larger category of “Natural Gas Systems”, the EPA identifies emissions occurring during distinct stages of operation, including field production, processing, transmission and storage, and distribution. “Petroleum Systems” sub-activities include production field operations, crude oil transportation and crude oil refining. Within the two categories, the BLM has authority to regulate only those field production operations that are related to oil and gas measurement, and prevention of waste (via leaks, spills and unauthorized flaring and venting).

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

The EPA data show that improved practices and technology and changing economics have reduced CO<sub>2</sub> emissions from oil and gas exploration and development (Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2010 (EPA, 2012b). 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. While EPA data shows that methane emissions increased from oil and gas exploration and development from 1990-2010, reductions in methane emissions from oil and gas exploration and development should occur in future years as a result of EPA’s recently finalized oil and gas air emissions regulations.

### **4.3.3 Cultural and Paleontological Resources**

Subsequent development of the lease could have impacts on archaeological and paleontological resources. Required archaeological surveys would be conducted upon all subsequent actions that are expected to occur from the lease sale to avoid disturbing cultural and/or paleontological sites.

Consequential project construction has the potential to impact cultural and paleontological resources.

**Potential Mitigation:** Avoidance measures would be imposed where ever cultural and/or paleontological resources are impacted. There are very high site densities in areas outside of the proposed lease parcels and it can be expected that these high site densities may carry over into the parcels. The approach to cultural resource survey in all of the proposed parcels is complete survey of any parcel in which development of the lease is proposed. This approach to survey will serve two purposes.

The first and most important of these for the lessee is a knowledge base from which to make informed decisions about how and where to proceed with development in that parcel. Subsequent costs can be avoided or curtailed by selection of areas without sites or with sites that can be relatively inexpensively mitigated. Planning in subsequently developed parcels can be partially informed from the ongoing collection of information about sites in the immediate area.

The second advantage accrues to the agency and provides information about the resource that is not currently available.

#### **4.3.4 Socio-economics and Environmental Justice**

No minority or low income populations would be directly affected in the vicinity of the proposed lease parcel. 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 agriculture and recreational activities. However, these impacts would apply to all land users in the area.

**Potential Mitigation:** Mitigation is deferred to site-specific development at the APD stage.

#### **4.3.5 Invasive, Non-native Species**

While the act of leasing Federal minerals produces no impacts, subsequent development produces impacts in the form of surface disturbance. 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, 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. Potential for 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 these construction areas would minimize this impact.

Impacts by noxious weeds will 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.

#### **4.3.6 Wildlife and Fisheries**

##### **4.3.6.1 4.3.7.1 Special Status Species**

Exploration and development of the proposed parcel may produce impacts to special status species. Surface disturbance from the development of well pads, access roads, pipelines, and utility lines can result in removal of wildlife habitat.

The potential for direct and indirect impacts to Special Status Species can't be analyzed until the site specific APD stage of development. All of the parcels have habitat that may support federally listed and/or BLM sensitive species. Site specific biological surveys would be required at the APD stage and development proposals may require Section 7 consultation under ESA.

Potential direct and indirect impacts can't be analyzed until site-specific proposals are analyzed at the APD stage of development.

**Potential Mitigation:** General mitigation includes attaching protective stipulation WO-ESA-7, which states that consultation with USFWS may be needed, would be attached to all proposed parcels since Federally protected species or their habitat may be in or near the proposed parcel either now or in the future. Controlled Surface Use can be used to direct development to a portion of the lease parcel where negative impacts to special status species would be avoided or minimized. Specific mitigation measures are deferred to site-specific development at the APD stage.

#### 4.3.6.2 Wildlife and Wildlife Habitat

While the act of leasing a parcel would produce no immediate impacts to wildlife and wildlife habitats, subsequent development of the lease would result in both short and long-term impacts. Exploration and development of the proposed parcel may produce impacts to wildlife and wildlife habitat. Surface disturbance from the development of well pads, access roads, pipelines, and utility lines can result in removal of wildlife habitat.

Mechanisms through which oil and gas development impact wildlife and wildlife habitats include:

- Altered vegetation structure
- Altered fire regime
- Structural habitat
- Alteration of soil structure
- Alteration of water regimes
- Change in water quality
- Noise Impacts
- Physical disturbance by vehicles and human activity
- Physical and chemical hazards to wildlife

While all of these impacts can and usually do occur as a result of oil and gas development, without more specific information as to when and where such development may later be proposed on a lease, it is impossible at this stage of the process to quantify and analyze potential spatial and temporal impacts of potential development.

Long-term direct and indirect impacts to wildlife and habitats 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 power lines has taken place. 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).

**Potential Mitigation:** The BLM will require oil and gas lessees to operate in a manner that will minimize adverse impacts to wildlife and apply reasonable measures to all oil and gas exploration/development activities. Measures would be taken to prevent, minimize, or mitigate impacts to fish and wildlife animal species from exploration and development activities, including specific mitigation measures (i.e. rapid revegetation, noise restriction, project relocation, pre-disturbance surveys, etc.) unique to the proposed development site, but would be deferred until the APD process.

Wildlife COAs are generally included in all approved APDs and the use of standard BMPs provide extra measures of protection to wildlife populations and habitats in the area. Impacts to the wildlife resource component of the environment can be avoided or minimized by adopting the COAs and BMPs.

#### **4.3.6.3 Fisheries and Aquatic Habitats**

Development of the surrounding watershed will impact the stream directly and indirectly. Directly the stream and fisheries habitat will be affected if development fluids spill and reach the stream either directly or from monsoonal precipitation. This in turn will likely kill all in stream fauna including fishes and invertebrates and severely curtail the health of the riparian ecosystem. Construction activities and other development actions could impact the stream indirectly, as well, through nonpoint sources of pollution.

As there is no water or riparian vegetation in and around Group B parcels, no impacts would be made to Fishery and Aquatic habitats. Further analysis is needed to determine the impacts to fisheries and aquatic habitat within Group A parcels.

**Potential Mitigation:** None.

#### **4.3.7 Wastes, Hazardous or Solid**

Exploration and development of the proposed lease could result in the introduction of hazardous and non-hazardous substances to the site. Hazardous substances may be produced, used, stored, transported or disposed of as a result of the project. Properly used, stored, and disposed of hazardous and non-hazardous substances greatly decreases the potential for any impact on any environmental resources. One way operators and the BLM ensure hazardous and non-hazardous substances are properly managed is through the preparation of a Spill Prevention, Control, and Countermeasure (SPCC) plan.

**Potential Mitigation:** These lease sale parcels are regulated under the Resource Conservation and Recovery Act (RCRA) Subtitle C regulations which are extremely stringent. As well as, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) that provides for the exclusion of petroleum, including crude oil or any fraction thereof from the definition of hazardous substance, pollutant, or contaminant. The mitigation would include the stringiest regulation of waste containment within the project areas.

Specific mitigation is deferred to the APD process. The following measures are common to most projects: all trash would be placed in a portable trash cage and hauled to an approved landfill, with no burial or burning of trash permitted; chemical toilets would be provided for human waste; fresh water zones encountered during drilling operations would be isolated by using casing and cementing procedures; a berm or dike would enclose all production facilities if a well is productive; and all waste from all waste streams on site would be removed to an approved disposal site.

#### **4.3.8 Floodplains**

The act of leasing Federal minerals produces no impacts to floodplains. However, the subsequent development of Group B parcels may produce impacts in the form of surface disturbance. Surface disturbance from development of well pads, access roads, pipelines and power lines can result in impairment of floodplain values from removal of vegetation, wildlife habitat, impairment of water quality, decreased flood water retention and ground water recharge. Further analysis is needed to determine the impacts to floodplains within Group A parcels.

**Potential Mitigation:** Two new stipulations are being developed to protect resources such as floodplains, playas and alkali lakes within areas that contain these features. The stipulation would prohibit surface disturbance within up to 200 meters of the outer edge of a 100-year floodplain, playa and alkali lake, to

protect the integrity of these features. This stipulation would be applied to parcels 004, 005, 006, 007, 008, 021 and 152. Other potential mitigation measures include:

The operator would stockpile the topsoil from the surface of well pads which would be used for surface reclamation of the well pads. Reserve pits would be re-contoured and seeded 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.

### **4.3.9 Water Resources**

#### **4.3.9.1 Water Quality: Surface and Groundwater**

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

Potential direct 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 as a result of soil disturbance: increased salt loading and potential 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 and playas, 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 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.

Hydraulic fracturing is a common process and applied to nearly all wells drilled. Hydraulic fracturing fluid is roughly 99 percent water but also contains numerous chemical additives as well as propping agents, such as sands. Chemicals added to stimulation fluids include friction reducers, surfactants, gelling agents, scale inhibitors, acids, corrosion inhibitors, antibacterial agents, and clay stabilizers. Stimulation techniques have been used in the United States since 1949. Over the last 10 years, advances in multi-stage and multi-zone hydraulic fracturing has allowed development of gas fields that previously were uneconomic.

Contamination of groundwater could occur without adequate cementing and casing of the proposed well bore. Casing specifications are designed and submitted to the BLM. The BLM independently verifies the casing program, and the installation of the casing and cementing operations are witnessed by certified Petroleum Engineering Technicians. Surface casing setting depth is determined by regulation. Adherence to APD COAs and other design measures would minimize potential effects to groundwater quality.

In the long term, 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. Further analysis is needed to determine the impacts to water quality within Group A parcels.

**Potential Mitigation:** Use of plastic-lined reserve pits would reduce or eliminate seepage of drilling fluid into the soil and eventually reaching groundwater. Spills or produced fluids (e.g., saltwater, oil, and/or condensate in the event of a breach, overflow, or spill from storage tanks) could result in soil contamination on-site, or off-site, and may potentially impact surface and groundwater resources long-term. Casing and cementing requirements imposed on proposed wells would reduce or eliminate the potential for groundwater contamination from drilling muds and other surface sources. All appropriate standards and guidelines outlined in the BLM- Gold Book (2007) would be followed.

#### **4.3.9.2 Watershed**

While the act of leasing a parcel would produce no impacts, subsequent development of Group B parcels would result in long and short-term alterations to the hydrologic regime. Surface flows of ephemeral streams would be directly affected by an increase in impervious surfaces resulting from the construction of the well pad and road. Potential hydrologic effects to peak flow is reduced infiltration where surface flows can move quickly during overland flow and to ephemeral streams, causing peak flow to occur earlier and to be larger. Increased magnitude and volume of peak flow can cause bank erosion, rill and gully formation, channel widening, downward incision, and disconnection from the floodplain.

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 power lines 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.

Further analysis is needed to determine the impacts to the watershed hydrology within Group A parcels.

**Potential Mitigation:** Surface disturbance will not be allowed within up to 200 meters of playas. The operator would stockpile the topsoil from the surface of well pads which would be used for surface reclamation of the well pads. Reserve pits would be re-contoured and seeded 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.

#### **4.3.10 General Topography /Surface Geology**

General topography and surface geology of the lease parcels are generally impacted by the construction projects that are permitted as a result of subsequent APD actions.

The direct impact from a lease sale is that land involved could fall within an environmental sensitive area and subsequent lease actions could impact the issues of environmental concern. Split estate is an issue of concern on a lease sale when and if a private surface landowner is not in agreement with the proposed project which could create an environmental sensitive area until issues are resolved with the surface owner. Indirectly, proposed projects could fall within protected areas that would require changing spacing requirements of a well by moving locations or roads.

Given the topography, local geology and potential impacts to these resources in Group A, further analysis will be needed.

**Potential Mitigation:** This lease sale could have mitigation measures imposed on the proposed subsequent action when and if the concern involves issuance of such mitigation measures that are deemed necessary to resolve environmental predicaments.

#### 4.3.11 Soil

While the act of leasing a tract would produce no 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, soil exposure, 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 soil surfaces could cause a long-term reduction in site productivity. Some of these direct 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.

Given the slope and soil characteristics and potential impacts to soil resources in Group A, further analysis will be needed.

**Potential Mitigation:** The operator would stockpile the topsoil from the surface of well pads which would be used for surface reclamation of the well pads. Soil impacts would be remedied upon reclamation of well pads when this 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 seeded 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 disturbed areas as described in attached Conditions of Approval.

Road construction requirements and regular maintenance would alleviate potential impacts to access roads from water erosion damage.

#### 4.3.12 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.

Infestations of noxious weeds can have a disastrous impact on biodiversity and natural ecosystems. Noxious weeds affect native plant species by out-competing native vegetation for light, water and soil nutrients. Furthermore, noxious weeds can negatively affect livestock by making forage either unpalatable or toxic, thus decreasing livestock productivity and potentially increasing producers' feed and animal health care costs. Noxious weeds also affect recreational uses, and reduce realty values of both the directly influenced and adjacent properties.

**Potential Mitigation:** Mitigation is primarily deferred to site-specific development at the APD stage. If potential wells are productive disturbed areas not needed for the production facility would be reclaimed. In the case of non-productive wells, all disturbed areas should be reclaimed through reseeding or vegetative cover reestablishment. BMPs identified in BLM guidance documents such as the Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development: The Gold Book (USDI, 2007) recommend areas to be restored with native vegetation in regards to both species and structure.

#### **4.3.13 Livestock Grazing**

While the act of leasing Federal minerals would produce no direct impacts to livestock grazing, subsequent development of a lease may produce impacts. 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, impact existing range improvements (fences, pipelines, troughs, storage tanks), 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:** Mitigation would be addressed at the site-specific APD stage of exploration and development. 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, repair and or replacement of existing range improvements, and fugitive dust control.

#### **4.3.14 Recreation**

While the act of leasing Federal minerals produces no 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 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 land, county roads or through state land during hunting seasons.

**Potential Mitigation:** Mitigation would be addressed at the site-specific APD stage of exploration and development. Measures would be taken to prevent, minimize, or mitigate impacts to recreation from exploration and development activities.

#### 4.3.15 Visual Resources

Visual resource management is broken into four VRM classes. Group A VRM classes are Classes II, III and IV. For parcels in Group B, 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 Mimbres RMP. 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 Olive Drab 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 Olive Drab 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.

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.

#### 4.3.16 Lands & Realty Impacts

Leasing of these nominated parcels would create a need for legal access in order for the operator to conduct exploration and drilling processes.

**Potential Mitigation:** The operator would be required to apply for and obtain a right-of-way over public land for legal access on lands outside of the oil and gas lease. Site specific information of access roads would be analyzed during an APD process. A ROW application would be required to be filed with the Las Cruces District Office. Special ROW stipulations would apply.

#### 4.3.17 Cave/Karst

Tracts proposed for leasing may be located in a low, medium or high karst potential area. If the lease is in a low karst potential area there may be very little challenges in producing petroleum products from this location. If the proposed lease is in a medium or high karst potential area there could be the potential of adverse impact to known cave entrances or karst features is present within the lease area. Leasing does not in itself cause a problem to a cave or karst area.

**Potential Mitigation:** Mitigation would be addressed at the site-specific APD stage of exploration and development if caves or karst features exist. Measures would be taken to prevent, minimize, or mitigate impacts to caves and karst features from exploration and development activities.

### 4.4 Cumulative Impacts

The NMSO manages approximately 41 million acres of Federal mineral estate. Of the 41 million acres, 35 million acres are available for oil and gas leasing. Approximately 17% of the 35 million acres is currently leased (73% of the leases are in production and 63% of the lease acres are in production). The NMSO received 151 parcel nominations (92,147.63 acres) for consideration in the July 2013 Oil & Gas Lease Sale, and is proposing to lease 68 (30,820.16 acres) of the 151 parcels. If these 68 parcels were leased, the percentage of Federal minerals leased would not change. The Carlsbad, Roswell, Farmington and Oklahoma Field Office (Oklahoma and Texas) parcels are analyzed under separate EAs.

**Figure 15. Actual - Acres of Federal Minerals/Acres Available/Acres Leased:**

State	Federal O&G Mineral Ownership	Acres Available	Acres Leased	Percent Leased
KS	744,000	614,586	127,414	21%
NM	34,774,457	29,751,242	5,023,215	17%
OK	1,998,932	1,668,132	330,800	20%
TX	3,404,298	3,013,207	391,091	13%
Totals/Average	40,921,687	35,058,167	5,862,520	17%

**Figure 16. Parcels Nominated & Offered in the July 2013 Oil & Gas Lease Sale:**

Field Office	No. of Nominated Parcels	Acres of Nominated Parcels	No. of Parcels to be Offered	Acres of Parcels to be Offered
Carlsbad	39	17,148.76	25	9,172.14
Farmington	48	23,878.12	6	2280.20
Las Cruces	35	43,160.58	10	11,417.65
Texas	13	3,761.31	13	3,761.31
Oklahoma	16	4,468.855	14	4,188.855
Totals	151	92,417.63	66	30,820.16

**Figure. Foreseeable - Acres of Federal Minerals/Acres Available/Acres Leased:**

State	Federal O&G Mineral Ownership	Acres Available	Acres Leased	Percent Leased
KS	744,000	614,586	127,654	21%
NM	34,774,457	29,751,242	5,046,084.99	17%
OK	1,998,932	1,668,132	334,988.85	20%
TX	3,404,298	3,013,207	394,852.31	13%
Totals/Average	40,921,687	35,058,167	5,903,260	17%

#### 4.4.1 Cumulative Effects on Air Resources

The following analysis of cumulative impacts of the proposed action on air quality will be limited to Otero County, New Mexico. The cumulative impacts of GHG emissions and their relationship to climate change are evaluated at the national and global levels in the Air Resource Technical Report (USDI BLM 2011).

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

The primary activities that contribute to air pollution and GHG emissions in Otero County include vehicle travel and non-road mobile equipment (EPA, 2011). The Air Quality Technical Report includes a description of the varied sources of national and regional emissions that are incorporated here to represent the past, present and reasonably foreseeable impacts to air resources (USDI BLM 2013). It includes a summary of emissions on the national and regional scale by industry source. Sources that are considered to have notable contributions to air quality impacts and GHG emissions include electrical generating units, fossil fuel production (nationally and regionally) and transportation.

#### 4.4.3 Cumulative Effects of the Proposed Action on Air Resources

##### 4.4.3.1 Cumulative Effects of the Proposed Action on Air Quality

The very small increase in emissions that could result from approval of the proposed action would not result in any Otero County exceeding the NAAQS for any criteria pollutants. The applicable regulatory

threshold for HAPs is the oil and gas industry National Emissions Standards for Hazardous Air Pollutants, which are currently under review by the EPA. The emissions from the proposed well are not expected to impact any criteria pollutant standards in Otero County.

#### **4.4.3.2 Cumulative Effects of the Proposed Action on Climate Change**

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

The Air Quality Technical Report (USDI BLM, 2011) discusses the relationship of past, present and future predicted emissions to climate change and the limitations in predicting local and regional impacts related to emissions. It is currently not feasible to know with certainty the net impacts from particular emissions associated with activities on public lands.

### **5 Consultation/Coordination**

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

### **6 List of Preparers**

Kendrah Penn, Realty Specialist  
Corey Durr, Hydrologist  
Jennifer Montoya, Planning and Environmental Coordinator  
Lisa Phillips, Rangeland Management Specialist  
David Legare, Archaeologist  
Mohammad Nash, Soil Scientist/Hydrologist  
Oswaldo Gomez, Outdoor Recreation Planner  
Joe Sanchez, Natural Resource Specialist  
Kathryn Lloyd-Wilderness  
John Thacker-Paleontological Coordinator  
Vanessa Duncan, HazMat  
Patrick Moran, Geologist  
Mark Hakkila, Wildlife Biologist  
Ray Hewitt, GIS Specialist  
Donald Maki, GIS Specialist  
Joseph Navarro, Environmental Protection Specialist  
Mary Uhl, NMSO Environmental Protection Specialist – Air Resources

### **7 Public Involvement**

The parcels nominated for this sale, along with the appropriate stipulations from the RMP, were posted online for a two week review period, January 28<sup>th</sup> through February 11<sup>th</sup>. Comments were received from the Center for Biological Diversity. This EA will be made available for public review and comment for 30

days beginning March 1, 2013. Any comments received, including those from the Center for Biological Diversity, will be evaluated and incorporated into the EA as appropriate.

## 8 References

Environmental Protection Agency. 2011. Technology Transfer Network: Clearinghouse for Inventories and Emissions Factors. <http://www.epa.gov/ttn/chief/einformation.html>.

Environmental Protection Agency. 2011a. 2005 National-Scale Air Toxics Assessment. Summary of Results. <http://www.epa.gov/ttn/atw/nata2005>.

Environmental Protection Agency. 2010a. The Green Book Non Attainment Areas for Criteria Pollutants. <http://www.epa.gov/airquality/greenbk/> (Accessed 3/03/2011).

Environmental Protection Agency, Washington, D.C., EPA Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006.

EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008. EPA 430-R-10-006, <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>.

Environmental Protection Agency, Washington, D.C., Natural Gas Star Program (2006 data) at: <http://www.epa.gov/gasstar/accomplish.htm>.

New Mexico Oil Conservation Division. 2010b. Statistics, Production Summary Report. Available at <http://www.emnrd.state.nm.us/ocd/statistics/Production/ProductionSummaryReport.aspx>

Peddie, W. A. 1993. New Mexico Vegetation: Past, Present and Future. University of New Mexico Press.

Rustay and Norris (2007). New Mexico Bird Conservation Plan.

Scholle, P. A., 2003, Geologic Map of New Mexico, 1:500,000: New Mexico Bureau of Geology and Mineral Resources.

U.S. Department of the Interior, Bureau of Land Management. 1986. White Sands Approved Resource Management and Plan Record of Decision. Las Cruces, New Mexico.

USDI. BLM. 2013. Air Quality Technical Report. New Mexico State Office. [http://www.blm.gov/nm/st/en/prog/more/air\\_resources/air\\_resources\\_technical.html](http://www.blm.gov/nm/st/en/prog/more/air_resources/air_resources_technical.html).

### 8.1 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 LAS CRUCES DISTRICT LEASE STIPULATION SUMMARY**

<b>Stipulation</b>	<b>Description/Purpose</b>
LC-3-CSU	<p><b>CONTROLLED SURFACE USE – OFF ROAD VEHICLE USE</b></p> <p>Vehicular use is limited to existing roads and trails in order to prevent damage to cultural resources (in accordance with the Federal Register Notice of July 31, 1980 - Rattlesnake Hill limited ORV Designation). Exceptions may be granted when the lessee/operator submits a surface use and operations plan which is satisfactory to the authorized officer of the Bureau of Land Management, for the protection of cultural resources.</p>
LC-14-CSU	<p><b>CONTROLLED SURFACE USE – THREATENED &amp; ENDANGERED SPECIES HABITAT</b></p> <p>The lease area contains special values, is needed for special purposes or requires special attention to prevent damage to surface resources. Surface use or occupancy within the lease will be strictly controlled.</p>
LC-48-TCP	<p><b>TRADITIONAL CULTURAL PROPERTIES</b></p> <p>The lease may contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. Ground disturbing activities will not be approved if they affect any such properties or resources until obligations under applicable requirements of the NHPA and other authorities have been completed.</p>
LC-51-CSU	<p><b>FLOODPLAINS – PENDING DEVELOPMENT</b></p> <p>No surface disturbance within up to 200 meters of the outer edge of a 100-year floodplain, playa and alkali lake, to protect the integrity of these features</p>
LC-XX-LN	<p><b>RANGE MONITORING PLOT OCCURENCE</b></p> <p>This lease contains rangeland monitoring plot(s) which may require avoidance from any surface disturbing activities.</p>
NM-LN-11	<p><b>LEASE NOTICE – CULTURAL RESOURCES</b></p> <p>All development activities proposed under the authority of this lease are subject to compliance with Section 106 of the National Historic Preservation Act and Executive Order 13007. Compliance could require intensive cultural resource inventories, Native American consultation and mitigation measures to avoid adverse effects.</p>
WO-ESA-7	<p><b>CONSULTATION STIPULATION</b></p> <p>The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals 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. BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. § 1531 <i>et seq.</i>, including completion of any required procedure for conference or consultation.</p>