DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
OKLAHOMA FIELD OFFICE

Project: January 2011 Competitive Oil and Gas Lease Sale
DOI-BLM-NM-2010-2010-071-EA
Location: Various Locations in Blaine, Canadian, and Roger Mills Counties, Oklahoma.

Decision Record

The decision is to accept the Preferred Alternative (Alternative C) and offer five (5) parcels of federal minerals totaling 535.29 acres for sale in January 2011 with the addition of further stipulations and lease notices to certain parcels. The Preferred Alternative is in compliance with the 1994 Oklahoma Resource Management Plan, as amended.

The following 5 parcels would be offered in the lease sale:

Parcel	Comments	Acres
NM-201101-046 T.11S, R.09E, PM Sec. 017 Lots 3,4,5	Private Surface Lease with the following Stipulations: ORA-1, Floodplain Protection ORA-2, Wetland/Riparian Protection WO-ESA-7, Threatened and Endangered Species ORA-3, Lesser Prairie Chicken (Time restriction) ORA-5, Lesser Prairie Chicken	60.02
NM-201101-047 T.0140N, R.013W, PM Sec. 021 Lots 6, 7;	Private Surface Lease with the following Stipulations: ORA-1, Floodplain Protection ORA-2, Wetland/Riparian Protection WO-ESA-7, Threatened and Endangered Species ORA-3, Lesser Prairie Chicken (Time restriction) ORA-5, Lesser Prairie Chicken	18.74
NM-201101-048 T16N, R22W, IM PM Sec. 17 (Lot 1 (12.82 ac) and Sec. 18 (Lot 2 (39.99 ac); Ellis County, OK	Private Surface Lease with the following Stipulations: ORA-1, Floodplain Protection ORA-2, Wetland/Riparian Protection ORA-3, Lesser Prairie Chicken (Time restriction) ORA-5, Lesser Prairie Chicken WO-ESA-7, Threatened and Endangered Species ORA-5, Lesser Prairie Chicken	52.81

NM-201101-049 T.015N, R.025E, NM PM, NM Sec. 014 W2NE, E2NW,W2SW;	United States Forestry Service-SMA Lease with the following Stipulations: FS1 (Cibola) Occupancy restrictions FS3 (OK) CSU-1 300 ft. Corridor from riparian corridors FS3 (OK) CSU-2 Closed circulation system required FS3 (OK) NSO-1 No Surface Occupancy	240.00
NM-201101-050 T.015N, R.025E, PM Sec. 018 Lots 1,2; Sec. 18 E2NW.	United States Forestry Service-SMA Lease with the following Stipulations: FS1 (Cibola) Occupancy restrictions FS3 (OK) CSU-1 300 ft. Corridor from riparian corridors	163.54

Alternatives Considered:

The EA considered three alternatives: the No Action Alternative, the Proposed Action, and the Proposed Action with stipulations.

Rationale:

The five (5) parcels described in the EA were reviewed by Oklahoma Lease Staff, an interdisciplinary group of internal and external resource specialists, at the Oklahoma Field Office. The purpose of the review was to determine if the parcels were in areas open to oil and gas leasing; if leasing was in conformance with the existing land use plans; if new information had been developed which might affect leasing suitability; to ensure that appropriate lease stipulations were attached to each lease parcel; and to verify that appropriate consultations had been conducted.

The professional opinion of BLM biologist, using BLM inventory and monitoring data, is that no species listed threatened, endangered, or proposed for listing under the Federal Endangered Species Act (ESA) would be adversely affected by sale of the lease parcels. Effects of oil and gas leasing and development on threatened or endangered species were analyzed in an ESA Section 7 consultation (Consultation 2010-288-FED-BLM). No new information has been uncovered which would change that analysis. Additional review and analysis would occur when site-specific proposals for development are received.

New information regarding greenhouse gas emissions and climate change has been developed since the RMP. This information has been incorporated into this environmental assessment numbered DOI-BLM-NM-040-2010-071. Analysis determined that leasing the subject tracts could lead to eventual development which would result in small incremental increases in Greenhouse Gas (GHG) emissions. These emissions will be minimized by special conditions of approval developed for specific development proposals.

Mitigating measures and/or stipulations were considered and analyzed in the environmental assessment. Appropriate lease stipulations and lease notices will be attached to individual parcels as listed in the EA.

Administrative Review and Appeal:

A protest process for this Decision Record has been instituted to reconcile differences between oil and gas lease sale and NEPA regulations; and improve the opportunities for public input into agency decisions. This Decision Record for the Environmental Assessment must be protested under 43 CFR 3120.1-3. Protests must be received within 30 days of the signed decision record. You may file a protest by mail, in hardcopy form or by telefax. You may not file a protest sent to a fax number other than the fax number identified below. Any protests filed by electronic mail will be dismissed. A protest filed by fax must be sent to (505) 954-2000 or by mail to: BLM New Mexico, 301 Dinosaur Trail, PO Box 27115, Santa Fe, NM 87502 Attn: Minerals-Protests.

A protest must state the interest of the protesting party in the matter. The protest must also include any statement of reasons to support the protest. The BLM will dismiss a late-filed protest or a protest filed without a statement of reasons.

If the party signing a protest is doing so on behalf of an association, partnership or corporations, the signing party must reveal the relationship between them. Before including your phone number, e-mail address, or other personal identifying information in your protest, you should be aware that your entire protest – including your personal identifying information – may be made publicly available at any time. While you can ask the BLM in your protest to withhold any your personal identifying information from public review, the BLM cannot guarantee that it will be able to do so.

Prepared by:

/s/ Jackie Badley, Environmental Protection Specialist Date: 11/23/2010
Name, Title

Reviewed By:

/s/ George Thomas, Asst. Field Manager for Multi-Resources Date: 11/23/2010
Name, Title

Approved by:

/s/ Stephen Tryon Date: 11/23/2010
Name, Field Office Manager

DEPARTMENT OF THE INTERIOR
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Project: January 2011 Competitive Oil and Gas Lease Sale
DOI-BLM-NM-040-2010-071-EA
Location: Various Locations in Blaine, Canadian, Ellis, and Roger Mills, Oklahoma.

Finding of No Significant Impact

Based on the analysis of potential environmental impacts contained in the attached environmental assessment, I have determined the Preferred Alternative is not expected to have significant impacts on the environment. The impacts of offering fluid minerals leases in the areas described with this EA have been previously analyzed in the 1993 Oklahoma Resource Management Plan; and the lease stipulations that accompany the tracts offered for lease would mitigate the impacts of future development on these tracts. Therefore, preparation of an Environmental Impact Statement is not warranted.

Prepared by:

/s/ Jackie Badley, Environ. Prot. Spec. Date: 11/23/2010

Reviewed By:

/s/ George Thomas, Acting Asst. Field Mgr.for Multi-Res. Date: 11/23/2010

Approved by:

/s/ Stephen Tryon, Oklahoma Field Office Manager Date: 11/23/2010

BUREAU OF LAND MANAGEMENT
OKLAHOMA FIELD OFFICE

ENVIRONMENTAL ASSESSMENT FOR
January 2011 OIL AND GAS LEASE SALE
NM-040-2010-071-EA

1.0 Introduction

It is the policy of the Bureau of Land Management (BLM) to make mineral resources available for disposal and to permit development of mineral resources to meet national, regional, and local needs. The BLM New Mexico State Office conducts a quarterly competitive lease sale to sell available oil and gas lease parcels in New Mexico, Oklahoma, Texas, and Kansas. A Notice of Competitive Lease Sale, which lists lease parcels to be offered at the auction, is published by the BLM State Office at least 45 days before the auction is held. Lease stipulations applicable to each parcel are specified in the Sale Notice. The decision as to which public lands and minerals are open for leasing and what leasing stipulations may be necessary, based on information available at the time, is made during the land use planning process.

In the process of preparing a lease sale the BLM State Office sends a draft parcel list to each field office where the parcels are located. Field Office staff then review the legal descriptions of the parcels to determine if they are in areas open to leasing; if 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, and if there are special resource conditions of which potential bidders should be made aware. Once the draft parcel review is completed and returned to the State Office, a list of available lease parcels and stipulations is made available to the public through a Notice of Competitive Lease Sale (NCLS). Occasionally, additional information obtained after the publication of the NCLS, results in withdrawal of certain parcels or addition of stipulations prior to the day of the lease sale.

The following Environmental Assessment (EA) documents the Oklahoma Field Office review of the five (5) parcels (535.29 acres) offered in the January 2011 Competitive Oil and Gas Lease Sale that are under the administration of the Oklahoma Field Office. It serves to verify conformance with the approved land use plans and provides the rationale for modifying the lease stipulations as needed to protect resource values based on additional analysis of tracts previously analyzed in the Oklahoma Resource Management Plans (Oklahoma Resource Management Plan Record of Decision and Plan (OKRMP/ROD) approved April 12, 1994.

The five (5) parcels reviewed consist of: three (3) split-estate parcels, where the

surface is privately owned and the subsurface held by the Federal government. Two of the tracts are managed by the United States Forest Service. The Bureau of Land Management is responsible for leasing such parcel for applying any relevant special stipulations.

1.1 Purpose and Need

The purpose of offering parcels for competitive oil and gas leasing is to allow private individuals or companies to explore for and develop oil and gas resources for sale on public markets.

The sale of oil and gas leases is needed to meet the growing energy needs of the United States public. Continued leasing is necessary to maintain options for production as oil and gas companies seek new areas for production or attempt to develop previously inaccessible or uneconomical reserves.

1.2 Conformance with Applicable Land Use Plan and Other Environmental Assessments

Pursuant to 40 Code of Federal Regulations (CFR) 1508.28 and 1502.21, this environmental assessment (EA) tiers to and incorporates by reference the information and analysis contained in the Oklahoma Resource Management Plan. The OKRMP OKRMP/ROD (4/12/1994) describes specific split estate tracts in Oklahoma, and the stipulations that would be attached to the tracts if they were to be offered for lease. The Federal Land Policy and Management Act of 1976 (FLPMA) established guidelines to provide for the management, protection, development, and enhancement of public lands (Public Law 94-579). Section 103(e) of FLPMA defines public lands as any lands and interest in lands owned by the U.S. The mineral estate is an interest owned by the U.S. While the BLM has no authority over use of the surface by the surface owner, 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 Code of Federal Regulations (CFR) 3101.1 and 43 CFR 1601.0-7(b); BLM Manual Handbook 1601.09 and 1624-1).

Site specific analysis as required by the National Environmental Policy Act (NEPA) of 1969, as amended (Public Law 91-90, 42 USC 4321 et seq.) was conducted by OFO resource specialists who relied on personal knowledge of the areas involved and reviewed existing databases and file information to determine if appropriate stipulations had been attached to specific parcels. In some cases, field visits occurred.

It is unknown when, where or if future well sites or roads might be proposed. Also, at the time of this review, it is unknown whether a parcel will be sold and a lease issued. Analysis of projected surface disturbance impacts, should a lease be developed, was estimated based on potential well densities listed in the

Reasonable Foreseeable Development Scenario used as the basis for the 1994 OKRMP/ROD. Detailed site specific analysis of individual wells or roads would occur when a lease holder submits an Application for Permit to Drill (APD).

The Energy Policy Act of 2005 categorically excludes certain oil and gas development activities from further NEPA analysis. However, excluded projects must conform with the applicable RMP including any restrictions to development presented in the Plan.

Leasing the proposed tracts with protective stipulations would not be in conflict with any other Federal agency, local, county, or state plans.

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

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

Oklahoma Field Office (OFO) biologists reviewed the proposed action and determined it would be in compliance with threatened and endangered species management and consultation guidelines outlined in the biological assessments (BA) Oklahoma RMP BA dated March 4, 1993. Pursuant to the aforementioned BA and RMP no further consultation with the U.S. Fish and Wildlife Service (FWS) is required at the leasing stage.

Compliance with Section 106 responsibilities of the National Historic Preservation Act are adhered to by following the BLM Manual 8100, 36CFR Part 800, 43CFR Part 7, and the Cultural Resources Handbook H-8100-1 (For New Mexico, Oklahoma, Kansas, and Texas). When draft parcel locations are received by the Oklahoma Field Office, cultural resource staff reviews the location for any known Cultural Resources on BLM records.

Tribal Consultations will not be completed until specific locations for proposed projects are received, reviewed by the State SHPO, the BIA and specific Tribes. When particular Tribes respond during consultation, that tribe will be directly involved in negotiations with the BLM to determine if the project should be moved, or other mitigation will be required.

2.0 Alternatives Including the Proposed Action

Five (5) lease parcels were originally nominated and proposed for inclusion in the January 2011 Competitive Oil and Gas Lease Sale; therefore, this EA will deal with the five (5) potential lease tracts for which the BLM has jurisdiction.

2.1 Alternative A - No Action

The BLM NEPA Handbook (H-1790-1) states that for Environmental Assessments (EAs) on externally initiated proposed actions, the No Action Alternative generally means the continuation of current management practices and trends.

The No Action alternative would withdraw five lease parcels from the January 2011 lease sale. The parcels would remain available for inclusion in future lease sales. Surface management would remain the same and ongoing oil and gas development would continue on surrounding federal, private, state, and Indian leases.

If the BLM does not lease these Federal minerals, an assumption is that it is not expected that demand would decrease for oil and gas. Demand would likely be addressed through production elsewhere or imports. Due to less stringent environmental regulations in some areas outside of the U.S., it is possible that there would be increased emissions of volatile organic compounds (VOC), air borne dust, and greenhouse gasses (GHGs) during exploration and production operations. In addition, it is anticipated that there would be additional emissions of GHGs during transportation of these commodities to US ports.

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

2.2 Alternative B - Proposed Action

The Proposed Action would be a recommendation to the State Director that BLM offer for oil and gas leasing 5 split-estate parcels of federal minerals covering 535.29 acres administered by the Oklahoma Field Office. Standard terms and conditions as well as special stipulations listed in the RMP would apply.

All five (5) parcels, totaling 535.29 acres, contain a special Cultural Resources Lease Notice stating that all development activities proposed under the authority of these leases are subject to compliances with Section 106 of the NHPA and Executive Order 13007.

Once sold, the lease purchaser has the exclusive right to use as much of the leased lands 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 (43 CFR 3101).

Oil and gas leases are issued for a 10-year period and continue for as long thereafter as oil or gas is produced in paying quantities. If a lease holder fails to

produce oil and gas, does not make annual rental payments, does not comply with the terms and conditions of the lease, or relinquishes the lease, ownership of the minerals leased reverts back to the federal government and the lease can be resold. Four proposed lease tracts have been previously leased.

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

2.3 Alternative - C

Alternative C would be a recommendation to the State Director that BLM offer for oil and gas leasing five (5) parcels of federal minerals covering 535.29 acres administered by the Oklahoma Field Office. Standard terms and conditions, special stipulations listed the in OKRMP/ROD, and/or revised special stipulations and lease notices developed to protect resource values found on the tracts since the OKRMP/ROD would apply. The RMP directed that LN-1 be attached to any leases in counties containing suitable habitat for Threatened or Endangered (T/E) species. This lease notice has since been revised and is now called WO-ESA-7. This stipulation gives BLM the authority to modify any proposed actions as a result of the lease to ensure that threatened, endangered, or other special status plants, animals, or their habitats are not adversely affected. Endangered Species Act Section 7 consultation with the FWS would occur if development is proposed for a lease tract containing habitat suitable for T/E species. These new special stipulations (as required by 43 CFR 3131.3) would be added to all 5 parcels to update existing stipulations and/or lease notices and to address site specific concerns or new information not identified in the land use planning process.

The five (5) parcels would be included in the lease sale. Parcel number, location, stipulations, and acreage, are listed in the table below. Standard terms and conditions as well as special stipulations would apply. Lease stipulations (as required by Title 43 Code of Federal Registration 3131.3) would be added to the five (5) parcels to address site specific concerns or new information not identified in the land use planning process.

Once sold, the lease purchaser has the 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 (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; ownership of the minerals leased revert back to the federal government and the lease can be resold.

Drilling of wells on a lease is not permitted until the lease owner or operator secures approval of a drilling permit and a surface use plan specified under Onshore Oil and Gas Orders, Notice to Lessee's (NTL's) listed in Title 43 Code of Federal Registration 3162.

The five (5) parcels contain a special Cultural Resources Lease Notice stating that all development activities proposed under the authority of these leases are subject to compliance with Section 106 of the NHPA and Executive Order 13007. Standard terms and conditions as well as special stipulations listed in the RMP would apply.

No additional mitigation measures are necessary at this time; however, if parcels are developed in the future, site specific mitigation measures and BMPs would be attached as COAs for each proposed activity.

Portions of parcels recommended for leasing with stipulations*:

Parcel	Comments	Acres
NM-201101-046 T.11S, R.09E, PM Sec. 017 Lots 3,4,5	Private Surface Lease with the following Stipulations: ORA-1, Floodplain Protection ORA-2, Wetland/Riparian Protection WO-ESA-7, Threatened and Endangered Species	60.02
NM-201101-047 T.0140N, R.013W, PM Sec. 021 Lots 6, 7;	Private Surface Lease with the following Stipulations: ORA-1, Floodplain Protection ORA-2, Wetland/Riparian Protection WO-ESA-7, Threatened and Endangered Species	18.74
NM-201101-048 T16N, R22W, IM PM Sec. 17 (lot 1 (12.82 ac) and Sec. 18 (Lot 2 (39.99 ac); Ellis County, OK	Private Surface Lease with the following Stipulations: ORA-1, Floodplain Protection ORA-2, Wetland/Riparian Protection WO-ESA-7, Threatened and Endangered Species	52.81
NM-201101-049 T.015N, R.025E, NM PM, NM Sec. 014 W2NE, E2NW,W2SW;	United States Forest Service-SMA Lease with the following Stipulations: FS1 (Cibola) Occupancy restrictions FS3 (OK) CSU-1 300 ft. Corridor from riparian corridors FS3 (OK) CSU-2 Closed circulation system required FS3 (OK) NSO-1 No Surface Occupancy	240.00

NM-201101-050 T.015N, R.025E, PM Sec. 018 Lots 1,2; Sec. 18 E2NW.	United States Forest Service-SMA Lease with the following Stipulations: FS1 (Cibola) Occupancy restrictions FS3 (OK) CSU-1 300 ft. Corridor from riparian corridors FS3 (OK) CSU-2 Closed circulation system required FS3 (OK) NSO-1 No Surface Occupancy	163.54

*Standard terms and conditions as well as special stipulations would apply as additional lease stipulations (as required by Title 43 Code of Federal Registration 3131.3) to address site-specific concerns or new information not identified in the land use planning process.

2.4 Alternatives Considered But Not Analyzed In Detail

An alternative of offering all parcels with a no surface occupancy (NSO) stipulation was not analyzed in detail because those areas for which NSO was considered appropriate were analyzed in the Oklahoma RMP/EIS. Those areas requiring NSO are listed in the lease stipulations attached to individual parcels (see Appendix 1, Table 1).

No other alternatives to the proposed action were apparent which would meet the purpose and need of the proposed action.

3.0 Description of Affected Environment

This section describes the environment that would be affected by implementation of the alternatives described in Section 2. Aspects of the affected environment described in this section focus on the relevant major resources or issues. Certain critical environmental components require analysis under BLM policy. Only those aspects of the affected environment that are potentially impacted are described in detail. The following elements are not present: Areas of Critical Environmental Concern, Prime or Unique Farmlands, Wild and Scenic Rivers, Caves or karsts, Wilderness or Wilderness Study Areas, and Wild Horses and Burros.

The five (5) proposed lease parcels are located in Blaine, Canadian, Ellis, and Roger Mills Counties in Oklahoma. The individual parcels are described in Appendix One of the OKRMP/ROD. Generalized descriptions of the Oklahoma environment are contained in Chapter 3 of the Oklahoma RMP/ROD beginning on page 3-1.

In addition to the air quality information in the RMPs cited above, new information about GHGs and their effects on national and global climate conditions has emerged since the RMPs were prepared. On-going scientific research has

identified the potential impacts of GHG emissions such as carbon dioxide (CO_2) methane (CH_4); nitrous oxide (N_2O); water vapor; and several trace gasses on global climate. Through complex interactions on a global scale, GHG emissions cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and burning of fossil carbon sources have caused GHG concentrations to increase measurably, and may contribute to overall climatic changes, typically referred to as global warming.

This EA incorporates an analysis of the contributions of the proposed action to GHG emissions and a general discussion of potential impacts to climate.

3.1 Air Quality

The Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality, including seven nationally regulated ambient air pollutants. Regulation of air quality is also delegated to some states. Air quality is determined by atmospheric pollutants and chemistry, dispersion meteorology and terrain, and also includes applications of noise, smoke management, and visibility. Climate is the composite of generally prevailing weather conditions of a particular region throughout the year, averaged over a series of years. Greenhouse Gasses and the potential effects of GHG emissions on climate are not regulated by the EPA, however climate has the potential to influence renewable and non-renewable resource management.

The potential lease tracts are all located in rural areas of Oklahoma. Air quality in these areas is generally good. None of the potential lease tracts are located in any of the areas designated by the Environmental Protection Agency as “non-attainment areas” for any listed pollutants regulated by the Clean Air Act.

Air quality and climate are the components of air resources, which include applications, activities, and management of the air resource. 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.

3.2 Climate

Oklahoma is located in a temperate region and experiences occasional extremes of temperature and precipitation typical in a continental climate (University of Oklahoma, 2008). Most of the state lies in an area known as Tornado Alley characterized by frequent interaction between cold and warm air masses producing severe weather. An average 54 tornadoes strike the state per year—one of the highest rates in the world. Because of its position between zones of differing prevailing temperature and winds, weather patterns within the state can vary widely between relatively short distances.

The humid subtropical climate (Koppen *Cfa*) of the eastern part of Oklahoma influenced heavily by southerly winds bringing moisture from the Gulf of Mexico, but transitions progressively to a semi-arid zone (Koppen *BSk*) in the high plains of the Panhandle and other western areas from frequently touched by southern moisture. Precipitation and temperatures fall from east to west accordingly, with areas in the southeast averaging an annual temperature of 62 °F (17 °C) and an annual rainfall of 56 inches (1,420 mm), while areas of the panhandle average 58 °F (14 °C), with an annual rainfall under 17 inches (430 mm). All of the state frequently experiences temperatures above 100 °F (38 °C) or below 0 °F (−18 °C),[35] and snowfall ranges from an average of less than 4 inches (10 cm) in the south to just over 20 inches (51 cm) on the border of Colorado in the panhandle.

Table 3.3 summarizes components of climate that could affect air quality in the region.

Climate Component	**Temperature**
Mean maximum summer temperatures	90.0°F
Mean minimum winter temperatures	32.0°F
Mean annual temperature	62.0°F
Mean annual precipitation	36.0 inches
Mean annual snowfall	12.0 inches
Mean annual wind speed	12.2 mile per hour (mph)
Prevailing wind direction	Southwest

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

Greenhouse gases that are included in the US Greenhouse Gas Inventory are: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). CO2 and methane (CH4) are typically emitted from combustion activities or are directly emitted into the atmosphere. On-going scientific research has identified the potential impacts of greenhouse gas emissions (including CO2; CH4; nitrous oxide (N2O), water vapor; and several trace gasses) on global climate. Through complex interactions on regional and global scales, these greenhouse gas

emissions cause a net warming effect of the atmosphere (which making makes surface temperatures suitable for life on Earth), primarily by decreasing the amount of heat energy radiated by the Earth back into space. Although greenhouse gas levels have varied for millennia (along with corresponding variations in climatic conditions), recent industrialization and burning of fossil carbon sources have caused CO2 concentrations to increase dramatically, and are likely to contribute to overall climatic changes, typically referred to as global warming. Increasing CO2 concentrations also lead to preferential fertilization and growth of specific plant species.

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

A 2007 US Government Accountability Office (GAO) Report on Climate Change found that, "federal land and water resources are vulnerable to a wide range of effects from climate change, some of which are already occurring. These effects include, among others: 1) physical effects such as droughts, floods, glacial melting, and sea level rise; 2) biological effects, such as increases in insect and disease infestations, shifts in species distribution, and changes in the timing of natural events; and 3) economic and social effects, such as adverse impacts on tourism, infrastructure, fishing, and other resource uses."

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

3.3 Areas of Critical Environmental Concern (ACECs)

The BLM has no designated ACECs in Oklahoma.

3.4 Heritage Resources

3.4.1 Cultural Resources

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

The areas for lease were once the winter campgrounds for Native American tribes including Cheyenne-Arapaho, Kiowa, Apache, and Comanche.

Approximately 18,000 archeological sites are recorded in Oklahoma and over 1,000 historic properties in the state are listed on the National Register of Historic Places.

To assess the cultural resources of the leases, two avenues of inquiry were considered: literature or file review and Native American consultation. The literature review involved utilizing data sources including computerized data from the Oklahoma Archaeological Survey in Norman, Oklahoma. Native American consultation involved contacting by mail the Cheyenne and Arapaho Chairman, the Kiowa Tribe of Oklahoma Chairman, the Apache Tribe of Oklahoma Chairman, and the Comanche Tribe of Oklahoma Chairman.

Blanket cultural resource surveys have not been conducted on the proposed lease parcels. Site specific cultural resource surveys and appropriate mitigation measures are required as part of the APD process after parcels are leased.

3.4.2 Native American Religious Concerns

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

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

Tribal consultation involved contacting by mail the Cheyenne and Arapaho Chairman, the Kiowa Tribe of Oklahoma Chairman, the Apache Tribe of Oklahoma Chairman, and the Comanche Tribe of Oklahoma Chairman, concerning any TCPs.

3.4.3 Paleontology

All Cultural Resource Surveys for projects in the Oklahoma Field Office area of responsibility are required to include statements on any new paleontological material discovered during inventory. These reports are reviewed and new fossil material is reported to paleontologists. Protection and preservation of significant fossil materials in specific locations will be required in any BLM permitted projects.

3.5 Environmental Justice

Executive Order 12898 requires federal agencies to assess projects to ensure there is no disproportionately high or adverse environmental, health, or safety effects on minority and low-income populations. Because the BLM is prohibited by law from issuing oil and gas leases within city limits, all of the proposed lease tracts are located in rural, unincorporated areas of Oklahoma.

3.6 Farmlands, Prime or Unique

A review of soils data from the U.S. Department of Agriculture, Natural Resources Conservation Service for the proposed lease parcels designate none of the lease sale parcels in Oklahoma as Farmland of State-wide importance.

Site specific analysis of any proposed development as a result of these potential leases will document soils and prime or unique farmlands that may occur at the project site.

3.7 Floodplains

Some or portions of the five (5) lease tracts are located within the North Canadian and Washita River floodplains. 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 oil and gas development, farming activities, and several miles of boundary fence in the area.

3.8 Invasive, Non-native Species

No invasive species were identified.

3.9 Threatened or Endangered Species

OFO endangered species specialists also reviewed the locations of the sale parcels and compared them to the best T/E species information currently available and determined that all of the parcels proposed for lease sale contain potential habitat for a listed species. These tracts have been identified in Table 1 (Appendix 1).

Under Section 7 of the Endangered Species Act of 1973 (as amended), the BLM is required to consult with the U.S. Fish and Wildlife Service (FWS) on any proposed action which may affect federally listed threatened or endangered species or species proposed for listing. A detailed listing of threatened and endangered species within Oklahoma may be found on pages 3-11 to 3-13 of the OKDRMP/EIS.

3.10 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. U.S. Environmental Protection Agency (EPA) regulations define solid wastes as any “discarded materials” subject to a number of exclusions. On July 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 the proposed lease parcels.

3.11 Water Quality – Surface/Ground

Surface water within the area is affected by geology, precipitation, and water erosion. Factors that currently affect surface water resources include livestock grazing management, oil and gas development, and farming activities. All of the tracts are in the North Canadian and Washita River watersheds. Intermittent and perennial streams are located within the area of the proposed lease sale.

Groundwater within the area is affected by geology and precipitation. Factors that currently affect groundwater resources in the area include livestock grazing management, oil and gas development, groundwater pumping, and possible impacts from brush control treatments. Most of the groundwater in the area is

used for industrial, rural, domestic and livestock purposes. Information on water quality conditions in Oklahoma can be found on pages 3-5 through 3-7 of the OKRMP/ROD.

3.12 Wetlands /Riparian Zones

All of the proposed lease tracts contain, or potentially contain, wetlands and/or riparian zones. Additional information on, and discussion of, wetlands and riparian zones appears on pages 3-8 through 3-10 and 4-6 of the OKRMP/ROD.

3.13 Wild and Scenic Rivers

No Wild and Scenic Rivers occur in Oklahoma where the proposed lease tracts are located.

3.14 Wilderness

No wilderness areas or proposed wilderness areas occur in any of the Oklahoma where the proposed lease tracts are located.

3.15 Mineral Resources

The Anadarko Basin in Oklahoma is a major contributor to the natural gas supply of the nation. In 1997, almost three-fourths of the natural gas produced in Oklahoma came from the RMP planning area.

Oil and gas development began in the Oklahoma administrative area in the 1940s. Today, nearly all of the area with high potential for oil and gas production is under prior existing leases held by production. The Oklahoma fluid minerals program staff reviewed the proposed parcel lists and found no unresolved issues as a result of prior leasing: there are no active leases, no communitization agreements, and no unit agreements.

Mineral resources of the OFO are described on pages 3-16-3-21 of the OKRMP/ROD.

3.16 Soils

The Nobscot-Brownfield association occupies a majority of the southern three-fourths of the study area (Tracts NM-201101-48, -49 and 50), and the Pratt-Enterprise the northern one-fourth running parallel and adjacent to the Canadian River (Tracts NM-201101-46 and -47). The Nobscot-Brownfield association is described as smooth to rolling terrain, with very sandy soils on uplands, and with reddish subsoils. The water-holding capacity of this association is rated as low. Although suitable for cultivation, careful management is needed to maintain fertility and to control wind erosion. The Pratt-Enterprise association is steep to

hilly or dunelike, and sandy to moderately sandy. Water-holding capacity of this association is low. Less than 10 recent of its area is suitable for cultivation because of steep slopes. Both associations were formed from sandy eolian materials of Quaternary or Tertiary age (Burgess and others, 1963).

The State's varied climate and topography have combined to produce broad differences in state soils. In the eastern part of the state's soils have been developed where leaching is intense and conditions are humid. Western soils developed in an area of lesser rainfall. Further discussion of soil resources in Oklahoma may be found on pages 3-8 in the OKRMP/ROD.

3.17 Vegetation

All of the tracts are located in the Natural Resource Conservation Service, Central Great Plains ecoregion of Oklahoma. The Central Great Plains are slightly lower, receive more precipitation, and are somewhat more irregular than the Western High Plains to the west. Once a grassland, with scattered low trees and shrubs in the south, much of this ecological region is now cropland. The eastern boundary of the region marks the eastern limits of the major winter wheat growing area of the United States.

The Central Great Plains ecoregion is a mosaic of hummock and coppice dunes dominated by sand sage (*Artemisia filifolia*) and/or shinnery-oak (*Quercus havardii*) with a mixed-grass composition. Grasses consist largely of little bluestem (*Schizachyrium nees*), sandbluestem (*Andropogon hallii*), sand dropseed, and needle and threadgrass (*Stipa comata*). Soils in this habitat type are typically deep and well drained. They extend to a depth of 60 in (1.5 m) or more and have surface textures consisting of fine aeolian sands or loamy aeolian sands. Their water holding capacity is low and they are highly erodible. They become unstable dunes when organic residues and vegetative cover are removed (Natural Resource Conservation Service 1997; Ecological Site Description). Soils in the dune areas are also sharply drained sands and at the southwestern and southern boundaries of the type, the soils grade to a shallower calcic hardpan overlaid by shallow sand. These shallow soil sites are dominated by buffalograss (*Buchloe dactyloides*), blue grama (*Bouteloua gracilis*) and threeleaf sumac (*Rhus trilobata*) or littleleaf sumac (*Rhus microphylla*).

Proposed lease tracts are located in 3 Oklahoma counties. Pages 3-8 thru-3-11of the OKRMP/ROD provide further details on vegetation resources in the leasing area.

3.18 Livestock Grazing

Most areas of rural Oklahoma are used for livestock grazing on at least a seasonal basis. Oklahoma contains only a few small scattered parcels of public surface and only four small grazing leases administered by the BLM. None of these are on the lease sale.

3.19 Special Status Species

In accordance with BLM Manual 6840, BLM manages certain sensitive species not federally listed as threatened or endangered. Included in this category are state listed endangered species and federal candidate species which receive no special protections under the Endangered Species Act. Special status species (SSS) which occur in Oklahoma are listed on pages 3-11 through 3-13 of the PRMP/FEIS.

Table 3.22.1 Habitat Descriptions and Presence of BLM Oklahoma Field Office Special Status Species.

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

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

Lesser Prairie-Chicken (LPC)

Sand shinnery communities extend across the southern Great Plains occupying sandy soils in portions of north and west Texas, west Oklahoma, and southeast New Mexico. Portions of Blaine, Ellis, and Roger Mills counties consist largely of sand shinnery habitat and are intermixed with areas of mesquite to a lesser degree. The characteristic feature of these communities is co-dominance by shinnery oak and various species of grasses.

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

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

In the late 1980's, there were 24 documented active booming grounds known to exist within Oklahoma. Due to population decreases and unpredictable weather cycles the LPC is currently a candidate for federal listing. There are approximately 3,500 LPC left in Oklahoma.

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

Three of the parcels occur in suitable habitat for lesser prairie-chicken and will be available for leasing with stipulations (ORA-5) for the development of these parcels attached as prescribed in the Special Status Species.

3.20 Wildlife

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

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

Common mammal species using the area include white tailed deer, coyote, bobcat, Rio Grande and Eastern turkey, striped skunk, raccoon, cottontail, and red and gray squirrel.

Regional information on wildlife and their habitats in Oklahoma is contained on pages 3-8 to 3-10 of the OKRMP/ROD.

3.21 Wild horses and Burros

No wild and free roaming horses or burros occur in Oklahoma.

3.22 Recreation

No public recreation occurs within the proposed lease sale parcels.

3.23 Visual Resources

Visual Resource Management (VRM) on public lands is conducted in accordance with BLM Handbook 8410 and BLM Manual 8411. In Oklahoma the BLM has jurisdiction over only a few small scattered surface tracts and has not designated any VRM management classes. Oil and gas exploration and production facilities are a prominent feature of the visual landscape in the counties containing the proposed lease tracts.

3.24 Public Health and Safety

The area containing the lease parcels has been under oil and gas development for many years. Leasing of the parcels analyzed in this EA would present no new or unusual health or safety issues not covered by existing state and federal laws and regulations.

4.0 Environmental Consequences and Proposed Mitigation Measures

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. Under the No Action Alternative would result in the continuation of the current land and resource uses in the proposed lease areas. The No Action Alternative is also used as the baseline for comparison of alternatives.

It is an assumption that the No Action Alternative (no lease option) may result in a slight reduction in domestic production of oil and gas. This would likely result in reduced Federal and State royalty income, and the potential for Federal lands to be drained by wells on adjacent private or state lands. Consumption is driven by a variety of complex interacting factors including energy costs, energy efficiency, availability of other energy sources, economics, demography, and weather or climate. If the BLM were to forego 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**.**

Alternatives B and C

The act of leasing parcels would, by itself, have no impact on any resources in the OFO. The environmental consequences of oil and gas leasing in Oklahoma are analyzed in the OKRMP/ROD (pages 4-1 to 4-29). That analysis, which assumes that the impacts from an average well, pipeline and access road would total 4.25 acres of surface disturbance in Oklahoma is incorporated by reference into this document. All impacts would be tied to as yet undetermined future levels of lease development.

Short-term impacts are those which can be stabilized or mitigated rapidly (within 5 years). Long-term impacts are those that would substantially remain for more than 5 years.

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

4.1 Air Quality

4.1.1 Direct and Indirect Effects

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

The reasonable and foreseeable development scenario developed for the Oklahoma RMP demonstrated 20 wells would be drilled annually for Federal minerals. However, it is unknown whether the petroleum resources specific to these leases in the Proposed Action are gas or oil or a combination thereof, as well as the actual potential for those resources. In addition, oil wells are on a tighter spacing than gas wells, therefore the specific number of wells that would be drilled as a result of issuing the leases is unknown. Current APD permitting trends within the field office also confirm that these assumptions are still

accurate.

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

4.1.2 Potential Mitigation

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

The EPA data show that improved practices and technology and changing economics have reduced emissions from oil and gas exploration and development (Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006). One of the factors in this improvement is the adoption by industry of the BMPs proposed by the EPA's Natural Gas Energy Star program. The BLM’s regulatory jurisdiction over field production of Natural Gas Systems and production field operations of Petroleum Systems has resulted in the

development of “Best Management Practices” designed to reduce impacts to air quality by reducing all emissions from field production and operations. Any development which may result from leasing the subject parcels could be made subject to appropriate conditions of approval addressing greenhouse gas emissions that BLM may develop through future NEPA analysis at either the plan or development project level designed specifically to reduce or otherwise mitigate potential GHG emissions. Specific measures developed at the project stage could be incorporated as “Conditions of Approval” in the approved APD and are binding on the operator. Typical measures may include: Flare hydrocarbon and 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. Require that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored. Revegetate areas of the pad not required for production facilities to reduce the amount of dust from the pads.

The OFO will work with industry to facilitate the use of the relevant BMP's for operations proposed on federal mineral leases where such mitigation is consistent with agency policy.

4.2 Climate

4.2.1 Direct and Indirect Impacts

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

Leasing the subject tracts would have no direct impacts to the climate. Any potential effects to air quality from sale of lease parcels would occur at such time that the leases were developed. There is an assumption, however, that leasing the parcels would lead to some type of development that would have indirect effects on global climate through GHG emissions. However, those effects on global climate change cannot be determined. (Refer to the cumulative effects

section, Chapter 4 for additional information.) It is unknown whether the petroleum resources specific to these leases in the Proposed Action are gas or oil or a combination thereof.

Potential impacts of development could include increased air borne soil particles blown from new well pads or roads, exhaust emissions from drilling equipment, compressors, vehicles, and dehydration and separation facilities, as well as potential releases of GHG and volatile organic compounds during drilling or potential leaks. The amount of increased emissions cannot be quantified at this time since it is unknown how many wells might be drilled, the types of equipment needed in the case a well were to be completed successfully (compressor, separator, dehydrator, etc.), or what technologies may be employed by the companies drilling any new wells. The degree of impact will also vary according to the characteristics of the geologic formations from which production occurs.

The reasonable and foreseeable development scenario developed for the EIS for the Oklahoma RMP assumed 20 wells would be drilled annually on federal lands in the state. Current APD permitting trends within the field office confirm that these assumptions are still accurate. This level of exploration and production would contribute a small incremental increase in overall hydrocarbon emissions, including GHG's, released into the planet's atmosphere. When compared to total national or global emissions the amount released as a result of potential production from the proposed lease tracts would not have a measurable effect on climate change due to uncertainty and incomplete and unavailable information.

Consumption of oil and gas developed from the proposed lease parcels is expected to produce GHGs. 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 public's demand for the resource would not be expected to change, instead the resource foregone would be replaced by other sources that may include a combination of imports, fuel switching, and other domestic production. This displacement of supply would offset any reductions in emissions achieved by not leasing the subject tracts.

The assessment of greenhouse gas emissions and climate change is in its formative phase; therefore, it is not yet possible to know with confidence the net impacts to climate of global emissions. The inconsistency in results of scientific models used to predict climate change at the global scale coupled with the lack of scientific models designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts of decisions made at this level. The Department of the Interior is exploring whether global and regional climate modeling can be scaled to the point that it can be used to manage parks and refuges (GAO-07-863, 2007). When further information on the impacts to climate change is known, such information would be incorporated into

the BLM's planning and NEPA documents as appropriate.

4.2.1 Potential Mitigation

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

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

4.3 Areas of Critical Environmental Concern

Not present

4.4.1 Heritage Resources

4.4.1 Cultural Resources

While the act of leasing a parcel would produce no impacts, subsequent development of the lease could have impacts on archaeological 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 resources. Paleontological surveys will be required in areas where the potential for paleontological resources exist to avoid disturbing the paleontological resource.

4.4.1.2 Direct and Indirect Impacts

Potential threats to cultural resources from leasing are variable and dependent upon the nature of the cultural resource and the nature of the proposed

development. Effects normally include alterations to the physical integrity of a cultural resource. The greatest potential impact to cultural resources stems from the construction of associated lease related facilities such as pipelines, power lines, roads, and well locations. If a cultural resource is significant for other than its scientific information, effects may also include the introduction of audible, atmospheric, or visual elements that are out of character for the cultural site and diminish the integrity of those criteria that make the site significant. A potential effect from the proposed action is the increase in human activity or access to the area with the increased potential of unauthorized removal or other alteration to cultural resources in the area. These impacts could include altering or diminishing the elements of a National Register eligible property and diminish an eligible property's National Register eligibility status. Conversely, cultural resource investigations associated with development potentially adds to our understanding of the prehistory/history of the area under investigation and discovery of sites that would otherwise remain undiscovered due to burial or omission during review inventories.

4.2.1.2 Potential Mitigation

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

4.4.2 Native American Religious Concerns

4.4.2.1 Direct and Indirect Effects

The proposed action is not known to physically threaten any TCPs, prevent access to sacred sites, prevent the possession of sacred objects, or interfere or otherwise hinder the performance of traditional ceremonies and rituals pursuant to AIRFA or EO 13007. There are currently no known remains that fall within the purview of NAGPRA or ARPA that are threatened by leasing.

Use of lease notice NM-11-LN will help ensure that new information is incorporated into lease development. Additional consultation may be initiated at the APD stage of development if BLM professional staff determines it is necessary.

4.4.2.2 Potential Mitigation

No site-specific mitigation measures for Native American Religious Concerns have been recommended at this time for the parcels recommended to proceed for sale.

In the event that lease development practices are found in the future to have an adverse effect on Native American TCPs, the BLM, in consultation with the affected tribe, will take action to mitigate or negate those effects. Measures include, but are not limited to physical barriers to protect resources, relocation of practices responsible for the adverse effects, or other treatments as appropriate.

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

4.4.3 Paleontological Resources

4.4.3.1 Direct and Indirect Impacts

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

4.4.3.2 Mitigation

Specific mitigation measures, including, but not limited to, possible site avoidance or excavation would have to be determined when site-specific development proposals are received. However, in most surface-disturbing situations, paleontological resources would be avoided by project redesign or relocation. Should a paleontological locality be unavoidable, properties would be mitigated prior to implementation of a project.

4.5 Socioeconomic and Environmental Justice

4.5.1 Direct and Indirect Effects

Leasing the proposed tracts would have no direct effects on minority or low

income populations.

All proposed lease tracts are located in rural areas with low population densities (less than 50 people per square mile). No minority or low income populations would be disproportionately affected in the vicinity of the proposed action. Indirect effects could include effects 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 effects could include a small increase in activity and noise disturbance in areas used for grazing, agriculture, hunting and other activities.

4.5.2 Potential Mitigation

None required.

4.6 Farmlands, Prime or Unique

4.6.1 Direct and Indirect Effects

No direct effects from leasing. Oil and gas exploration which may result from leasing the tracts could result in an alteration of soil characteristics at the project area. These impacts would include localized compaction, alteration of soil horizons, and degradation of topsoil quality. None identified.

4.6.2 Potential Mitigation

None needed.

4.7 Floodplains

4.7.1 Direct and Indirect Effects

Parts or portions of five (5) lease parcels are within floodplains. Leasing the proposed parcels will result in no direct impacts to floodplains. Potential indirect results may occur if wells incorporating these Federal minerals are drilled as a result of this lease. Surface disturbance from the development of well pads, access roads, pipelines, and power lines can result in impairment of the floodplain values from removal of vegetation, removal of wildlife habitat, impairment of water quality, decreased flood water retention and decreased groundwater recharge.

4.7.2 Potential Mitigation

Protective stipulation ORA-1 would be attached to any lease of a tract which falls within a floodplain. ORA-1 states that, “All or portions of the lands under this

lease lie in and or adjacent to a major watercourse and are subject to periodic flooding. Surface occupancy of these areas will not be allowed without the specific approval, in writing, of the Bureau of Land Management." Attachment of ORA-1 for the purpose of protecting streams, rivers and floodplains, surface disturbance will not be allowed within up to 200 meters of the outer edge of 100-year floodplains, to protect the integrity of those floodplains.

Specific mitigation measures for any development which may result from leasing the subject tracts would be deferred until the locations of potential proposed actions are known.

4.8 Invasive, Non-native Species

None identified.

4.9 Threatened or Endangered Species

4.9.1 Direct and Indirect Effects

Leasing the tracts will have no direct impacts to Threatened or Endangered Species regardless if T/E species are present. If the lease results in development, approximately 4.25 acres of existing vegetation would be removed by drill pad, pipeline, and access road construction. Lesser prairie chickens (LPC) have limited tolerance for modification to their habitat. Impacts to LPC in the localized area, specifically while drilling the well and during construction of the drilling pad, access road, and associated infrastructures, may include but are not limited to: disruptions in breeding cycles, habitat degradation and fragmentation, avoidance of habitat during construction, and a decrease in prey base. These actions cause temporary disturbances due to the general increase in human activity and noise in the area. Longer term impacts would be due to the direct removal of habitat the size of the project's footprint causing a reduction in habitat for prey and fragmenting previously contiguous foraging area for LPC.

There would be a long-term change in plant and animal species composition and altered utilization of the site and surrounding area by wildlife. Site specific biological resource surveys would be required at the project stage and, depending on location and nature of the proposed development and the results of surveys, additional Section 7 consultation could be required.

BLM Wildlife Biologists will work with the applicant to locate the well and infrastructure in a location that minimizes potential impacts.

4.9.2 Potential Mitigation

The RMP directed that Lease Notice-1 be attached to any leases in counties containing suitable habitat for Threatened or Endangered (T/E) species. This

lease notice has since been revised and is now called WO-ESA-7. This stipulation gives BLM the authority to modify any proposed actions as a result of the lease to ensure that threatened, endangered, or other special status plants, animals, or their habitats are not adversely affected. Endangered Species Act Section 7 consultation with the FWS would occur if development is proposed for a lease tract containing habitat suitable for T/E species. If any surface disturbing actions are proposed as a result of this proposed lease a biological evaluation shall be conducted and site specific mitigating measures will be developed.

The ORA-3 stipulation used in the Oklahoma has been replaced by ORA-5 in order to provide additional protection and conservation measures for the lesser (and greater) prairie-chicken (LPC/GPC). Not only has the stipulation used for LPC/GPC concerns changed but the information available regarding the current occupied range of the species has changed. The RMPs directed that ORA-5 be attached to any leases in counties containing populations of LPC/GPC. ORA-5 was basically a timing restriction stipulation while ORA-5 contains measures other than a timing restriction. These stipulations are on the three fee parcels.

Three of the fee surface parcels carry WO-ESA-7, BLM's T/E species stipulation. These protective stipulations provide the authority to modify any proposed projects that might result from leasing the subject tracts

4.10 Wastes, Hazardous or Solid

4.10.1 Direct and Indirect Effects

Leasing the subject tracts would have no direct effect. The proposed lease could result in a project that has the potential for either short or long-term impacts to all resources to some manner or degree, by pollution from un-managed hazardous and non-hazardous waste streams.

4.10.2 Potential Mitigation

None required at the lease stage. If development results site specific measures are developed and attached to the permit to drill. Special conditions typically include:

(1) All identified fresh water zones will be isolated by using casing and cementing procedures (USGS base of treatable fresh water isopach maps).

(2) All wastes from all waste streams on site must be removed to an approved disposal site. No land disposal of any wastes on site will be permitted.

4.11 Water Quality: Surface and Groundwater

4.11.1 Direct and Indirect Effects

Leasing would have no affect on water quality. 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 brought about by soil disturbance: increased salt loading and water quality impairment of surface waters; channel morphology changes due to road and pipeline crossings; and possible contamination of surface waters by produced water. The magnitude of these impacts to water resources would depend on the proximity of the disturbance to the drainage channel, slope aspect and gradient, degree and area of soil disturbance, soil character, duration and time within which construction activity would occur, and the timely implementation and success or failure of mitigation measures.

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

Petroleum products and other chemicals, accidentally spilled, could result in surface and groundwater contamination. Similarly, possible leaks from reserve and evaporation pits could degrade surface and ground water quality. Authorization of the proposed projects would require full compliance with BLM directives and stipulations that relate to surface and groundwater y issues. If development results, potential effects would depend on site specific location of future development and cannot be predicted or quantified at the leasing stage. General conditions of approval at the APD stage include reclamation of plant communities and use of culverts and silt traps to stabilize and reduce sediment flow. Existing regulations require operators ensure an adequate casing program is designed to protect ground water from contamination.

4.11.2 Potential Mitigation

Any potential mitigation is deferred to the site-specific APD stage of development. Best management practices would be incorporated into Conditions of Approval. Some of these measures including casing design, erosion control, and revegetation are discussed in items 4.5.2, 4.7.2, and 4.10.2 above.

4.12 Wetlands/Riparian Zones

4.12.1 Direct and Indirect Effects

Two of the five potential lease tracts contain wetlands or potential wetlands. Leasing the proposed tracts will result in no direct impacts to wetlands. Potential indirect results may occur if wells incorporating these Federal minerals are drilled as a result of this lease.

4.12.2 Potential Mitigation

Protective stipulation ORA-2 would be attached to any lease of a tract containing wetlands and or riparian zones. ORA-2 states that, "All or portions of the lands under this lease contain wetlands and or riparian zones. Surface occupancy of these areas will not be allowed without the specific approval, in writing, of the Bureau of Land Management. Impacts or disturbance to wetlands and riparian habitats which occur on this lease must be avoided or mitigated. The mitigation shall be developed during the application to drill process." Specific mitigation measures for any development which may result from leasing the subject tracts would be deferred until the locations of potential proposed actions are known.

4.13 Wild and Scenic Rivers

None present

4.14 Wilderness

None present

4.15 Mineral Resources

4.15.1 Direct and Indirect Effects

If the proposed leases result in wells those wells have the potential to affect production horizons and reservoir pressures. If the wells are producers the resources allotted to these wells will eventually be depleted. The amount and location of direct and indirect effects cannot be predicted until the site specific APD stage of development. None of the lease parcels appear to present any conflict with the development of other mineral resources such as coal or sand and gravel.

4.15.2 Potential Mitigation

Deferred to the site specific APD stage of development. Spacing orders and allowable production orders are designed to conserve the oil and/or gas resource and provide maximum recovery.

4.16 Paleontology

4.16.1 Direct and Indirect Effects

Direct and indirect effects cannot be predicted without analysis of site specific development proposals. These proposals would occur at the APD stage of development. Potential impacts at that stage could include increased human activity and possibility of removal of, or damage to, paleontology resources. The increase in human activity in the area increases the possibility of irretrievable loss of information pertaining to the paleontology of the project region. Conversely, a benefit to paleontology resources could occur if potential future development results in a paleontology survey that adds to literature, information, and knowledge of paleontology resources.

4.16.2 Potential Mitigation

Specific mitigation measures, including, but not limited to, possible site avoidance or excavation and data recording would have to be determined when site specific development proposals are received.

4.17 Soils

4.17.1 Direct and Indirect Effects

Leasing would not directly affect soils. If oil and/or gas development is proposed on any of the proposed leases, site construction (pad, pipeline and road) will remove vegetation and compact approximately 4.25 acres of soil at each well site in Oklahoma. This will increase the potential for wind and sheet erosion and could decrease the permeability of compacted areas.

4.17.2 Potential Mitigation

The soil analysis deferred to the site-specific APD stage of development. Best management practices would be incorporated into Conditions of Approval. Typical conditions include: Six inches of top soil from the proposed location shall be stock piled and be available for reshaping during the restoration process. No cut and/or fill will take place outside of the staked surveyed area. Stockpiled soil shall be protected from wind and water erosion through prompt establishment and maintenance of effective, quick growing vegetative cover.

4.18 Vegetation, Forestry

4.18.1 Direct and Indirect Effects

Leasing would have no direct affect on vegetation or forestry. If oil and/or gas development occurs as a result of leasing, site clearing would remove vegetation from approximately 4.25 acres used as drill pad, access road and pipeline

construction for each well drilled.

4.18.2 Potential Mitigation

If potential wells are productive disturbed areas not needed for the production facility will be reclaimed resulting in approximately 2 acres impacted for the life of each well. In the case of non-productive wells all disturbed areas shall be reseeded and vegetative cover reestablished. Vegetation would be established on all areas of the location to be reclaimed. This phase of the reclamation process should be accomplished by using seed or sod. Current policy recommends that these areas be restored with native vegetation in regards to both species and structure. This recommended reclamation is contingent upon the wishes of the surface owner.

4.19 Livestock Grazing

4.19.1 Direct and Indirect Effects

Oklahoma contains only a few small scattered parcels of public surface and only four small grazing leases administered by the BLM. None of these are on the lease sale.

4.19.2 Potential Mitigation

None needed.

4.20 Special Status Species

4.20.1 Direct, Indirect and Cumulative Effects

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

4.20.1.2 Potential Mitigation

Lesser Prairie-Chicken
Lesser prairie-chicken are afforded specific protection measures pertaining to new drilling under the ORA-5. The protections include a ban on new drilling during the breeding season (between March 1 and May 31) and a restriction on other production activities, such as land survey and construction, between the hours of 3 a.m. and 9 a.m.

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

Stipulations for Lesser Prairie-Chicken Habitat:
Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1 through May 31 annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration or 3-D seismic operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

In light of these requirements and mitigation measures, minimal impacts to the lesser prairie-chicken are anticipated as a result of oil and gas activity.

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

If observations of lesser prairie-chickens are made, immediate contact with the local BLM office is required.

4.21 Wildlife

4.21.1 Direct and Indirect Impacts

The types and extent of impacts expected from oil and gas development to wildlife species and habitats from development are similar to those described in the Special Status Species Section. Although reclamation and restoration efforts for surface disturbance could provide for the integrity of other resources, these efforts may not always provide the same habitat values (e.g. structure, composition, cover, etc.) in the short or in some instance, the long-term in complex vegetative community types. The magnitude of above effects would be dependent on the rate and location of the oil and gas development, but populations could likely not recover to pre-disturbance levels until the activity was completed and the vegetative community restored.

4.21.2 Potential Mitigation

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

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4.22 Wild Horse and Burros

None present.

4.23 Recreation

Leasing would have no direct effect on recreation. There are no public recreation opportunities on privately owned property.

4.24 Visual Resources

4. 24.1 Direct and Indirect Effects

Potential effects cannot be determined until site specific development proposals are received at the APD stage. It is probable that any development which may result from these proposed leases would occur in areas where oil and gas exploration and production facilities are common features of the visual landscape.

4.24.2 Potential Mitigation

Appropriate BMP's shall be applied to any development which may occur as a result of offering these parcels of federal minerals for lease. BMP's could include such things as painting facilities to blend with surroundings and using topography

and/or vegetation to screen projects.

4.25 Public Health and Safety

4.25.1 Direct and Indirect Effects

Specific potential effects cannot be determined until site specific development proposals are received at the APD stage. Based on the history of oil and gas development in Oklahoma, overall effects of leasing less than one percent of the lands open to oil and gas development should result in negligible direct and indirect effects.

4.25.2 Potential Mitigation

Deferred to the APD stage when site specific requirements can be determined.

4.26 Cumulative Effects

Analysis of cumulative impacts for reasonably foreseeable development of oil and gas wells on public lands Oklahoma was presented in the OKRMP/EIS (pages 4-1 to 4-5). Potential development of all available federal minerals in Oklahoma including those in the proposed lease parcels was included as part of the analysis. Total surface disturbance projected by the plans was based on an estimated 20 federal wells being drilled annually in Oklahoma. The estimated 20 federal wells in Oklahoma were projected to disturb approximately 85 acres. Over the last 10 years there have been no changes to the basic assumptions or projections described in the OKRMP/EIS analysis.

More than 100 years of oil and gas development in Oklahoma have resulted in an extensive infrastructure of existing roads and pipelines. The extent of this development is illustrated by the following statistics. Oklahoma Corporation records show that 432,868 wells have been drilled in Oklahoma from 1904 to 2006. Impacts from this development will remain on the landscape until final abandonment and reclamation of facilities occurs as wells are plugged when they are no longer economically viable.

4.26.1 Climate Change

This section incorporates an analysis of the contributions of the proposed action to GHG emissions and a general discussion of potential impacts to climate. The EPA's Inventory of US Greenhouse Gas Emissions and Sinks found that in 2007, total U.S. GHG emissions were over 7 billion metric tons and that total U.S. GHG emissions have increased by 17% from 1990 to 2007. Emissions increased from 2006 to 2007 by 1.4 percent (99.0 Tg. CO2e). The following factors were primary contributors to this increase: (1) cooler winter and warmer summer conditions in 2007 than in 2006 increased the demand for heating fuels and contributed to the increase in the demand for electricity, (2) increased consumption of fossil fuels to

generate electricity and (3) a significant decrease (14.2 percent) in hydropower generation used to meet this demand (EPA 2009).

On-going scientific research has identified the potential effects of anthropogenic GHG emissions such as carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O) and several trace gasses; changes in biological carbon sequestration; and other changes due to land management activities on global climate. Through complex interactions on a global scale, GHG emissions cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although natural GHG atmospheric concentration levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and burning of fossil carbon sources have caused GHG concentrations to increase.

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

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

Currently, global climate models are inadequate to forecast local or regional effects on resources (USFS, 2008). However, there are general projections regarding potential impacts to natural resources and plant and animal species that may be attributed to climate change from GHG emissions over time; however these effects are likely to be varied, including those in the southwestern United States. For example, if global climate change results in a warmer and drier climate, increased particulate matter impacts could occur due to increased windblown dust from drier and less stable soils. Cool season plant species'

spatial ranges are predicted to move north and to higher elevations, and extinction of endemic threatened/endangered plants may be accelerated. Due to loss of habitat or competition from other species whose ranges may shift northward, the population of some animal species may be reduced or increased. Less snow at lower elevations would likely impact the timing and quantity of snowmelt, which, in turn, could impact water resources and species dependant on historic water conditions (USFS, March 2008).

The absence of a regulatory requirement to measure GHG emissions and the variability of oil and gas activities on federal minerals in Oklahoma prevent accurate quantification of GHG emissions that might occur as a result of making the proposed tracts available for leasing. The BLM can however make some generalizations: leasing the proposed tracts may contribute to ongoing drilling of an average of 20 wells a year on federal leases in the states of Oklahoma.. A total of 2427 wells were drilled in Oklahoma in 2006. This total, when compared to the estimates used for the cumulative analysis previously referenced, shows that wells drilled on federal leases wells may be expected to produce approx. 0.002 % of the GHG emissions produced from wells drilled in Oklahoma. The amount of GHG emissions are small, incremental contributions to the total emissions from the 3 state area, and are also insignificant when compared to global GHG emission levels. These small incremental contributions to global GHG gases cannot be translated into incremental effects on climate change globally or in the area of this site-specific action (see 1508.27a). The total amount of GHG emissions from oil and gas activities is expected to continue decreasing as improved technology and changing economics result in more complete control of GHG emissions at all stages of oil and natural gas systems.

5.0 Consultation/Coordination

This section includes individual comments received from the public and the resource specialists located within the Oklahoma Field office that participated in the development of this document.

5.1 Agencies, Persons and Organizations Consulted

-Black Kettle National Grassland, Cheyenne, OK
Private landowners

Table 5.1 Summary of Contacts Made During Preparation of Document and Interdisciplinary Team

ID Team Member	Title	Organization
Richard Fields	Archaeologist	BLM
Larry Levesque	Wildlife Biologist	BLM
Lisa Fretz	Realty Specialist	BLM
Jackie Badley	Environmental Protection	BLM

Pat Stong	Geologist	BLM

Table 5.2 Summary of Public Comments Received

5.2 Public Involvement

A comment letter was received from the Center for Biological Diversity (Center) on October 25, 2010 that provided comments on proposed oil and gas leases posted in the two week public scoping period from October 11 through 26, 2010. Responses to the comments made in regards to the nominated lease parcels are provided below.

Table 5.2 Summary of Public Comments Received

The table below summarizes the comments received in response to the two week public comment period of the nominated lease parcels.

No.	Comment	BLM Response
1	Deferrals of Parcel	OFO is not deferring any parcels. See section 2.3.
2	BLM must adhere to statutory requirements (i.e., NEPA, ESA, FLPMA).	See attached EA Sections 1..2 and 1.3
3	BLM acknowledges several parcels where Section 7 consultation is required.	The OK RMP directed lease notice, WO-ESA-1 to be attached to leases containing suitable habitat for T&E species. The notice informs the leasee that Section 7 consultation and/or project redesign may be required in the event that T&E species and/or suitable habitat is determined to be present. See section 2.3. Information on the Section 7 consultation completed for the TX RMP can be located in section 1.3.
5	Species of concern, including several endangered, threatened and candidate species, merit detailed analysis of environmental impact resulting from the January 2011 sale.	There is potential for the Arkansas River Shiner to occur in all of the tracts. None of the species listed in the CBD letter occur or have suitable habitat within any of the OK nominated parcels. For parcels with suitable habitat for species of concern, including endangered, threatened and candidate species, the WO-ESA-1 stipulation would apply. See comments 3 and 4 above.
4	Greenhouse Gas Emissions: NEPA analysis must assess and disclose environmental impacts of the proposed action to global climate change.	See attached EA Section 3.1 and 4.1

5	Water Quality	See sections 3.11 and 4.11

6. References

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

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

Enquist, Carolyn and Gori, Dave. Implications of Recent Climate Change on Conservation Priorities in New Mexico. April 2008.

Goddard Institute for Space Studies. 2007. Annual Mean Temperature Change for Three Latitude Bands. Datasets and Images. GISS Surface Temperature Analysis, Analysis Graphs and Plots. New York, New York. (Available on the Internet: http://data.giss.nasa.gov/gistemp/graphs/Fig.B.lrg.gif.)

Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007: The Physical Basis (Summary for Policymakers). Cambridge University Press. Cambridge, England and New York, New York. (Available on the Internet: http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf)

Intergovernmental Panel on Climate Change (IPCC). Climate Change 2007, Synthesis Report. A Report of the Intergovernmental Panel on Climate Change.

National Academy of Sciences. 2006. Understanding and Responding to Climate Change: Highlights of National Academies Reports. Division on Earth and Life Studies. National Academy of Sciences. Washington, D.C. (Available on the Internet: http://dels.nas.edu/basc/Climate-HIGH.pdf.)

US Government Accountability Office Report "Climate Change, Agencies Should Develop Guidance for Addressing the Effects on Federal Land and Water Resources" GAO-07-863, August 2007 (1st paragraph, 1st page, GAO Highlights) at: http://www.gao.gov/news.items/d07863.pdf.

U.S. Department of the Interior, Bureau of Land Management. 1993. *Oklahoma Proposed Resource Management Plan and Final Environmental Impact Statement*. Moore, Oklahoma

U.S. Department of the Interior, Bureau of Land Management. 1994. *Oklahoma Resource Management Plan Record of Decision*. Moore, Oklahoma.

U.S. Department of the Interior, Bureau of Land Management. 1995. *Texas*

Proposed Resource Management Plan and Final Environmental Impact Statement. Moore, Oklahoma

U.S. Department of the Interior, Bureau of Land Management. 1996. *Texas Resource Management Plan Record of Decision*. Moore, OK.

U.S. Department of Agriculture, Natural Resources Conservation Service. Web Soil Survey.

7. Authorities

Code of Federal Regulations (CFR)
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 July 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.