

United States Department of the Interior
Bureau of Land Management

Environmental Assessment-DOI-BLM-MT-C030-2011-0252-EA
October 3, 2012

North Dakota Field Office Oil and Gas Leasing EA for January 2012
Location: North Dakota Field Office

Location: North Dakota Field Office (see attached Appendix A for list of lease parcels by number and legal description and Map 1.1.1)

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In Reply Refer To:
1600/3100 (MTC030)

www.blm.gov/mt

October 26, 2011

Dear Reader:

The Bureau of Land Management (BLM) North Dakota Field Office prepared an Environmental Assessment (EA) in August to analyze potential effects from offering 26 parcels for competitive oil and gas leasing. The EA was available for a 30-day public comment period which ended on September 26, 2011.

A competitive oil and gas lease sale is scheduled to be held on January 24, 2012. It will be my recommendation to include the oil and gas lease parcels, along with stipulations identified in the BLM preferred alternative from the updated EA, in the Lease Sale Notice.

We anticipate finalizing our decision record either on or before the January 24, 2012 oil and gas lease sale, or prior to lease issuance. Upon finalization, the decision record and accompanying finding of no significant impact will be posted at the website listed below.

Please refer to the Montana/Dakotas BLM website at www.blm.gov/mt for availability of the updated EA and the Lease Sale Notice. From this home page, go to the heading titled "Frequently Requested," where you will find a number of links to information about our oil and gas program. Current and updated information about our EAs, Lease Sale Notices and corresponding information can be found on the link titled "Oil and Gas Lease Sale Information." Once there, click on 2012, and search for the January 24, 2012 lease sale to review information and analysis.

The BLM's decision to offer lands in the January 24, 2012 Oil and Gas Lease Sale is subject to a 30-day protest period, which begins October 26, 2011. Information on the Lease Sale Notice and protest procedures can also be found on the oil and gas website link.

If you have any questions, or would like more information about the updated EA or upcoming oil and gas lease sale, please contact us at 701-227-7700.

Sincerely,

A handwritten signature in blue ink that reads "Lonny R. Bagley". The signature is written in a cursive style with a large initial 'L' and a distinct 'R'.

Lonny R. Bagley
Field Manager

North Dakota Field Office Oil and Gas Leasing EA for January 2012

DOI-BLM-MT-C030-2011-0252-EA

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North Dakota Field Office Oil and Gas Leasing EA for January 2012

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1.0 PURPOSE & NEED

1.1 Introduction

It is the policy of the Bureau of Land Management (BLM) to make mineral resources available for use and to encourage development of mineral resources to meet national, regional, and local needs. This policy is based on various laws, including the Mineral Leasing Act of 1920 and the Federal Land Policy and Management Act of 1976. The Federal Onshore Oil and Gas Leasing Reform Act of 1987 (Sec. 5102(a)(b)(1)(A)) directs the BLM to conduct quarterly oil and gas lease sales in each state whenever eligible lands are available for leasing.

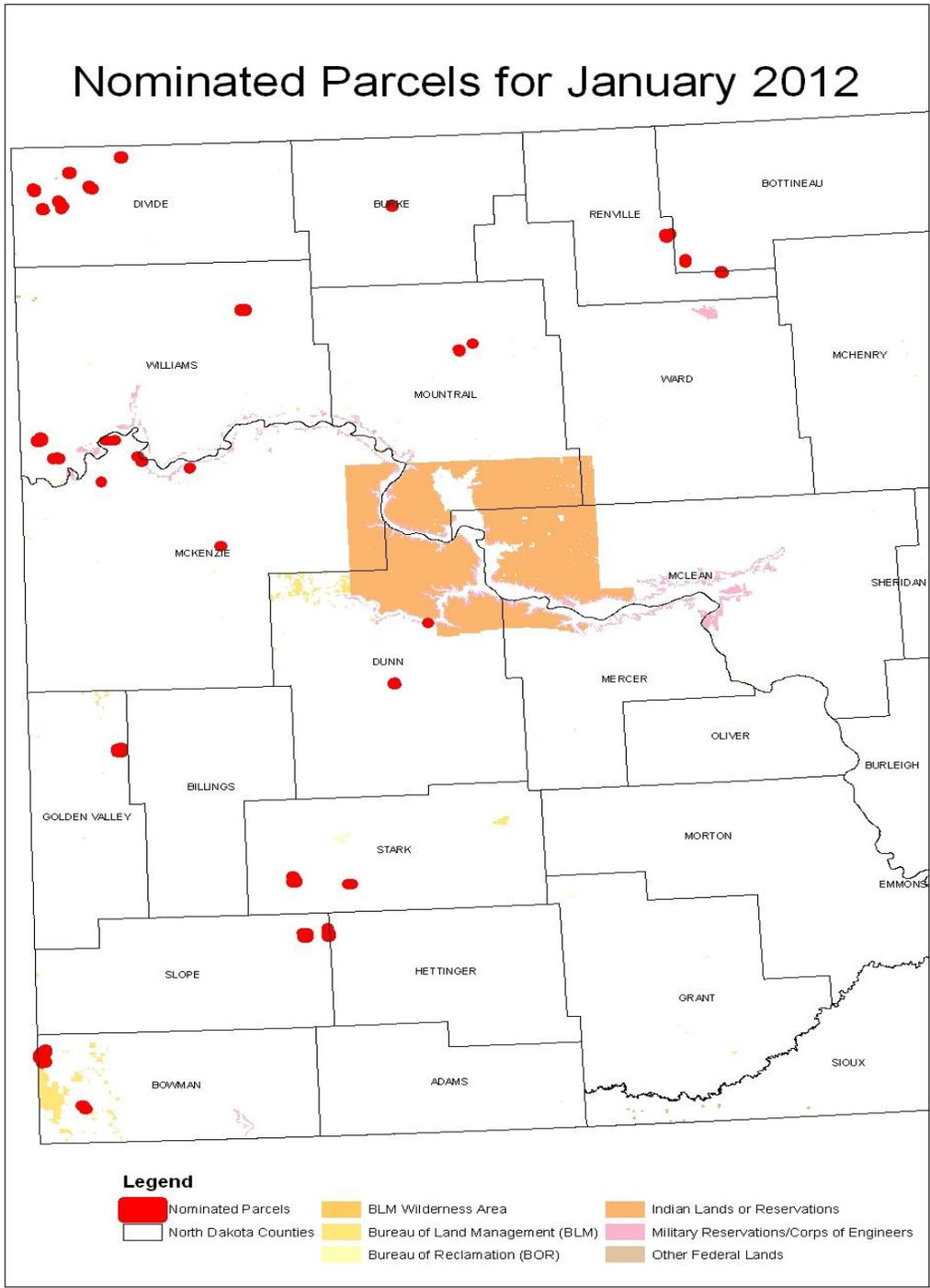
The Montana State Office (MSO) conducts mineral estate lease auctions for lands managed by the federal government, whether the surface is managed by the Department of the Interior (BLM or Bureau of Reclamation), United States Forest Service (USFS), or other departments and agencies. In some cases, the BLM holds subsurface mineral rights on split estate lands where the surface estate is owned by another party other than the federal government.

Oil and gas companies file Expressions of Interest (EOI) to nominate parcels for leasing by the BLM. From these EOIs, the MSO provides draft parcel lists to the appropriate field offices for review. BLM field offices then review legal descriptions of nominated parcels to determine: if they are in areas open to leasing; if new information has come to light which might change previous analyses conducted during the land use planning process; if there are special resource conditions of which potential bidders should be made aware; and which stipulations should be identified and included as part of a lease. Ultimately, all of the lands in proposed lease sales (including those covered by this Environmental Assessment [EA]) are nominated by the oil and gas industry and, therefore, represent areas of high interest.

This EA has been prepared to disclose and analyze the environmental consequences of leasing 35 parcels located in the North Dakota Field Office (NDFO) to be included in as part of a competitive oil and gas lease sale tentatively scheduled to occur January 24, 2012.

All 35 nominated parcels are located in western North Dakota within the NDFO planning area (see Map 1.1.1). The 35 parcels (herein referred to as the “study area”) are located within 12 counties in North Dakota. The counties included in the study area are: Bottineau, Bowman, Burke, Divide, Dunn, Golden Valley, McKenzie, Mountrail, Renville, Slope, Stark, and Williams.

Nominated Parcels for January 2012



Map 1.1.1 General Map of Nominated Lease Parcels

1.2 Purpose and Need for the Proposed Action

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.

This action is needed to help meet the energy needs of the people of the United States. By conducting lease sales, the BLM provides for the potential increase of energy reserves for the U.S., a steady source of significant income, and at the same time meets the requirement identified in the Energy Policy Act, Sec. 362(2), Federal Oil and Gas Leasing Reform Act of 1987, and the Mineral Leasing Act of 1920, Sec. 17.

The decision to be made in the Proposed Action for this EA is whether to sell oil and gas leases on the parcels in question, and, if so, what stipulations would be identified as required for specific parcels at the time of lease sale.

1.3 Conformance with Land Use Plan(s)

This EA is tiered to the decisions, information, and analysis contained in the North Dakota RMP (April 1988) and its associated Environmental Impact Statement (EIS), the governing land use plan for the NDFO. A more complete description of activities and impacts related to oil and gas leasing, development, production, etc. can be found on pages 9-10 in Chapter 2 of the RMP/EIS.

The parcels to be offered are within areas open to oil and gas leasing. Site-specific analysis was conducted during the summer of 2011 by NDFO resource specialists who relied on professional knowledge of the areas involved, review of existing databases and file information, and site visits to ensure that appropriate stipulations had been attached to specific parcels.

At the time of this review it is unknown whether a particular parcel will be sold and a lease issued. It is also unknown when, where, or if future well sites, roads, and facilities might be proposed. Assessment of projected activities and impacts was based on potential well densities discerned from the Reasonably Foreseeable Development (RFD) Scenario developed. Detailed site-specific analysis of activities associated with any particular parcel would occur when a lease holder submits an application for permit to drill (APD).

The proposed oil and gas leasing project would not be in conflict with any local, county, or state laws or plans.

1.4 Public Scoping and Identification of Issues

Public scoping for this project was conducted through a 15-day scoping period advertised on the BLM MSO website and posting on the NDFO website NEPA notification log (http://www.blm.gov/mt/st/en/fo/north_dakota_field.html). Scoping was initiated July 5, 2011; however, comments were accepted through August 19, 2011.

General questions unrelated to the leasing EA were received, but no comments were received identifying issues or concerns with this lease sale.

2.0 DESCRIPTION OF ALTERNATIVES, INCLUDING PROPOSED ACTION

2.1 Alternative A - No Action

For EAs on externally initiated Proposed Actions, the No Action Alternative generally means that the Proposed Action would not take place. In the case of a lease sale, this would mean that all expressions of interest to lease (parcel nominations) would be denied or rejected.

The No Action Alternative would exclude all 35 parcels within the NDFO from the lease sale. Surface management would remain the same and ongoing oil and gas development would continue on surrounding federal, private, and state leases.

2.2 Alternative B- Proposed Action

The Proposed Action Alternative would be to offer 35 parcels of federal minerals for oil and gas leasing, covering 7,314 acres administered by the NDFO. Parcel number, size, and detailed locations and associated stipulations are listed in Appendix A. Current RMP stipulations would be applied.

Of the 7,314 acres of federal mineral estate considered in this EA, approximately 1,246 acres (4 parcels in whole or part) are managed by the BLM, and approximately 433 393 acres (7 parcels in whole or part) are managed by other federal agencies. The remaining parcels are split estate.

In the instance of the parcels which are split estate, the BLM provided courtesy notification to private landowners that their lands would be included in this lease sale. If any activity were to occur on such split estate parcels, the lessee and/or operator would be responsible for adhering to BLM requirements as well as reaching an agreement with the private surface landowners regarding access, surface disturbance and reclamation.

Standard lease terms, conditions, and operating procedures, as well as additional stipulations as listed in Appendix A would apply to the split estate parcels. Standard

operating procedures for oil and gas development include measures to protect the environment and resources such as groundwater, air, wildlife, historical and prehistorical concerns, and others as mentioned in the 1988 RMP on pages 7 through 22. Lease stipulations (as required by 43 CFR 3131.3) would be attached to the parcels to address site-specific concerns or new information not previously identified in the land use planning process. Once sold, the lease purchaser would have the right to use as much of the leased lands as is reasonably necessary to explore and drill for all of the oil and gas within the lease boundaries, subject to the stipulations attached to the lease (43 CFR 3101.1-4).

Standard operating procedures, best management practices and required conditions of approval and the application of lease stipulations change over time to meet overall RMP objectives. In some cases new lease stipulations may need to be developed and these types of changes may require an RMP amendment.

Oil and gas leases would be issued for a 10-year period and would continue for as long thereafter as oil and 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; the lease would terminate and would be available for releasing in the future.

Drilling wells on a lease would not be permitted until the lease owner or operator secures approval of a drilling permit and a surface use plan specified at 43 CFR 3162.

2.3 Alternative C- BLM Preferred Alternative

The BLM Preferred Alternative would be to offer 32 parcels of federal minerals for oil and gas leasing, covering 5,908 acres administered by the NDFO. Parcel number, size, and detailed locations and associated stipulations are listed in Appendix A. Current RMP stipulations would be applied.

The following three parcels would be deferred due to Sage Grouse Concerns; NDM 97300-EH, NDM 97300-EK, and NDM 97300-EN.

Of the 5,908 acres of federal mineral estate considered in this EA, approximately 120 acres (2 parcels in whole or part) are managed by the BLM, and approximately ~~433~~ 393 acres (7 parcels in whole or part) are managed by other federal agencies. The remaining parcels are split estate.

In the instance of the parcels which are split estate, the BLM provided courtesy notification to private landowners that their lands would be included in this lease sale. If

any activity were to occur on such split estate parcels, the lessee and/or operator would be responsible for adhering to BLM requirements as well as reaching an agreement with the private surface landowners regarding access, surface disturbance and reclamation.

Standard lease terms, conditions, and operating procedures, as well as additional stipulations as listed in Appendix A would apply to the split estate parcels. Standard operating procedures for oil and gas development include measures to protect the environment and resources such as groundwater, air, wildlife, historical and prehistorical concerns, and others as mentioned in the 1988 RMP on pages 7 through 22. Lease stipulations (as required by 43 CFR 3131.3) would be attached to the parcels to address site-specific concerns or new information not previously identified in the land use planning process. Once sold, the lease purchaser would have the right to use as much of the leased lands as is reasonably necessary to explore and drill for all of the oil and gas within the lease boundaries, subject to the stipulations attached to the lease (43 CFR 3101.1-4).

Standard operating procedures, best management practices and required conditions of approval and the application of lease stipulations change over time to meet overall RMP objectives. In some cases new lease stipulations may need to be developed and these types of changes may require an RMP amendment.

Oil and gas leases would be issued for a 10-year period and would continue for as long thereafter as oil and 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; the lease would terminate and would be available for releasing in the future.

Drilling wells on a lease would not be permitted until the lease owner or operator secures approval of a drilling permit and a surface use plan specified at 43 CFR 3162.

2.4 Alternatives Considered but Eliminated from Detailed Analysis

An alternative to modify the existing stipulations for sage-grouse for three (3) parcels (NDM 97300-EH, NDM 97300-EK, NDM 97300-EN) was considered but dismissed from detailed study in this analysis. The subject lease parcel nominations were found to contain resource values and habitat that support greater sage-grouse. Additional review of research, as well as consideration of pending BLM guidelines and policies is needed to adequately consider leasing lands in priority sage-grouse habitat. Therefore, the subject parcels are proposed for deferral (refer to Alternative C – BLM Preferred Alternative).

3.0 AFFECTED ENVIRONMENT

3.1 Introduction

This chapter describes the existing environment (i.e., the physical, biological, social, and economic values and resources) that could be affected by implementation of the alternatives described in Chapter 2.

All 35 parcels are located in western North Dakota, which is located in the Northern Mixed Grass Prairie, known for its high diversity of vegetation types and topography. Vegetation is comprised of both tall and short grass as well as both warm and cool season grasses. A variety of grass-like plants, forbs, shrubs, and trees also add to the vegetation diversity of this rangeland type.

Western North Dakota is comprised of gently rolling hills, buttes, badlands, wetlands, riparian areas, and river breaks. Lands in North Dakota are primarily privately owned and are mainly utilized for agricultural uses. Lands that are not restricted by topography, water features, or soil constraints generally have been cultivated for crop production. Lands that have limitations from crop production are generally rangelands or pasture lands. Rangelands and pasture lands can be native, but can also be improved or rehabilitated croplands. Rehabilitated croplands are usually evident due to their near monoculture of introduced cool season grasses such as crested wheatgrass or smooth brome.

Temperatures throughout North Dakota fluctuate widely on an annual, seasonal, and daily basis. Annual mean temperatures range from 37°F in the northeast to about 43°F in the southwest. Temperature extremes can range from below -40°F to over 110°F. Average July temperature is about 69°F, and average January temperature is 10°F. Average annual precipitation varies from 13 inches in the northwest to about 20 inches in the east with up to 70 percent of the precipitation falling as rain between May and July. Precipitation is mainly derived from air masses originating from the Gulf of Mexico. Winters are long and cold with snow accumulations from November or December through March. Windy conditions are common due to the greatly fluctuating temperatures and lack of physical barriers. Prevailing winds are from the north-northwest at an average speed of 12 miles per hour (mph). Winds of 25-30 mph will often last for six hours and can last as long as 15 hours. Winds in excess of 30 mph have lasted more than six hours. Severe weather may occur almost any time during the year. Blizzards are a common occurrence during winter and early spring. High winds and hail frequently occur in connection with summer thunderstorms (NDFO RMP, 1988).

Specific components of the environment that may be affected by this project are discussed below. Only those aspects of the affected environment that are potentially impacted by these leases are described in detail.

The following aspects of the affected environment were determined to not be present, or not potentially impacted by these projects include: Lands with Wilderness Characteristics, Cave and Karst Resources, Forest Products, and Special Designations. Therefore; these resources and resource uses will not be discussed further in this EA.

3.2 Air Resources

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.

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.

3.2.1 Air Quality

Project area air quality is very good. The EPA air quality index (AQI) is an index used for reporting daily air quality (<http://www.epa.gov/oar/data/geosel.html>). It tells how clean or polluted an area's air is and whether associated health effects might be a concern. The AQI focuses on the potential health effects a person may experience within a few hours or days after breathing polluted air. EPA calculates the AQI for the five major criteria air pollutants regulated by the Clean Air Act (CAA): ground-level ozone, particulate matter, carbon monoxide, sulfur dioxide, and nitrogen dioxide. For each of these pollutants, EPA has established national air quality standards to protect public health. An AQI value of 100 generally corresponds to the national air quality standard for the pollutant, which is the level EPA has set to protect public health. The following terms help interpret the AQI information:

- **Good** - The AQI value is between 0 and 50. Air quality is considered satisfactory and air pollution poses little or no risk.
- **Moderate** - The AQI is between 51 and 100. Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small

number of people. For example, people who are unusually sensitive to ozone may experience respiratory symptoms.

- **Unhealthy for Sensitive Groups** - When AQI values are between 101 and 150, members of “sensitive groups” may experience health effects. These groups are likely to be affected at lower levels than the general public. For example, people with lung disease are at greater risk from exposure to ozone, while people with either lung disease or heart disease are at greater risk from exposure to particle pollution. The general public is not likely to be affected when the AQI is in this range.

In the context of ozone, all areas throughout Montana and the Dakotas are currently meeting federal standards in all locations. Light and dark blue circles in Figure 3.2.1.1 indicate standards being met in 2008. Open circles in Figure 3.2.1.2 indicate static trends.

For haze, trends appear to be improving for the clearest days (Figure 3.2.1.3), while there are no apparent trends for the haziest days (Figure 3.2.1.4).

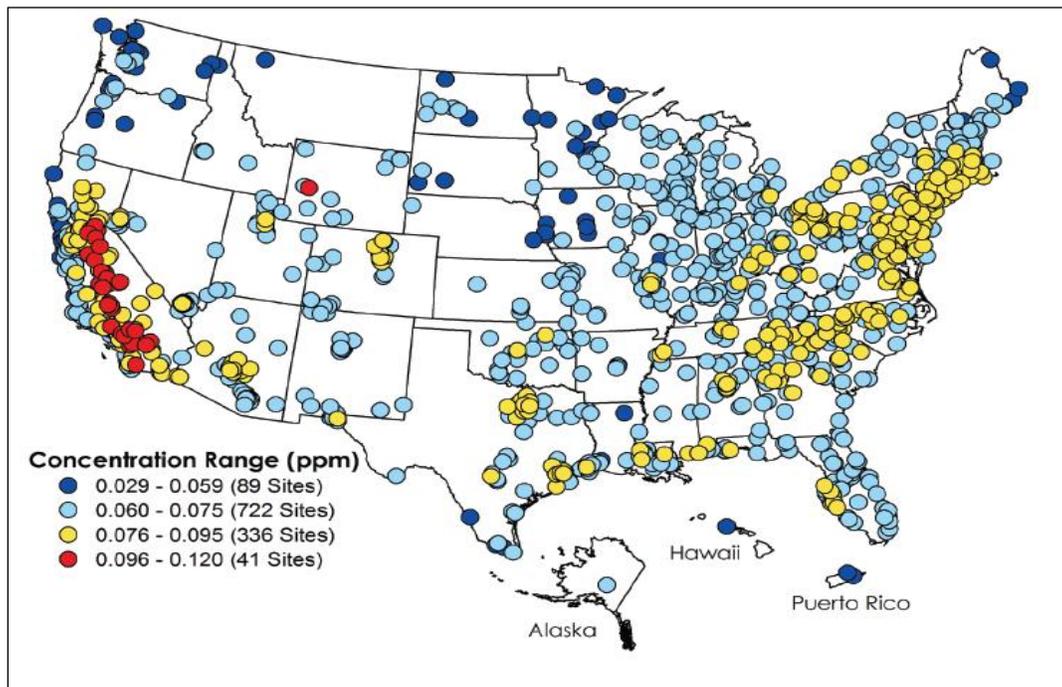


Figure 3.2.1.1. Ozone concentrations in ppm, 2008 (fourth highest daily maximum 8-hour concentration).

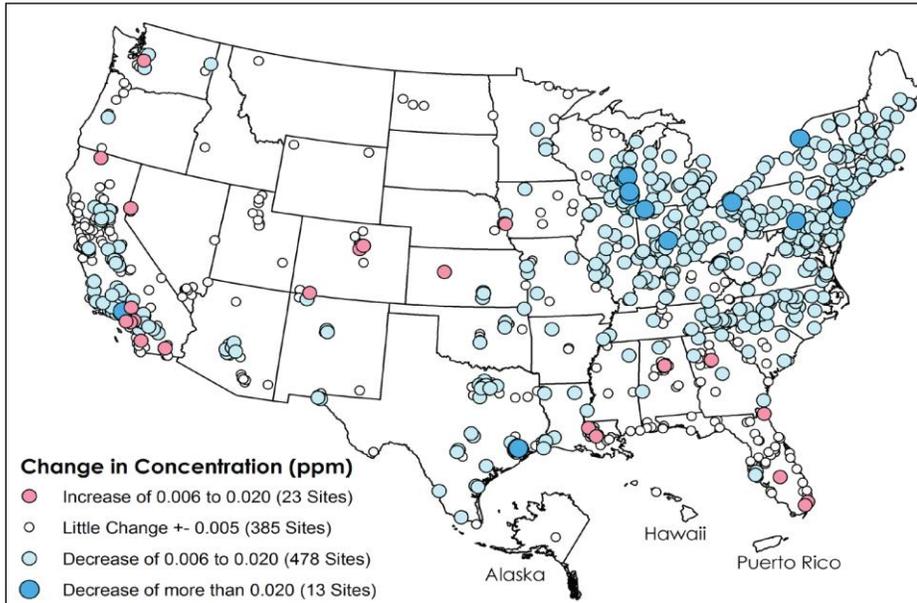


Figure 3.2.1.2. Change in ozone concentrations in ppm, 2001-2003 vs. 2006-2008 (three-year average of the annual fourth highest daily maximum 8-hour concentrations).

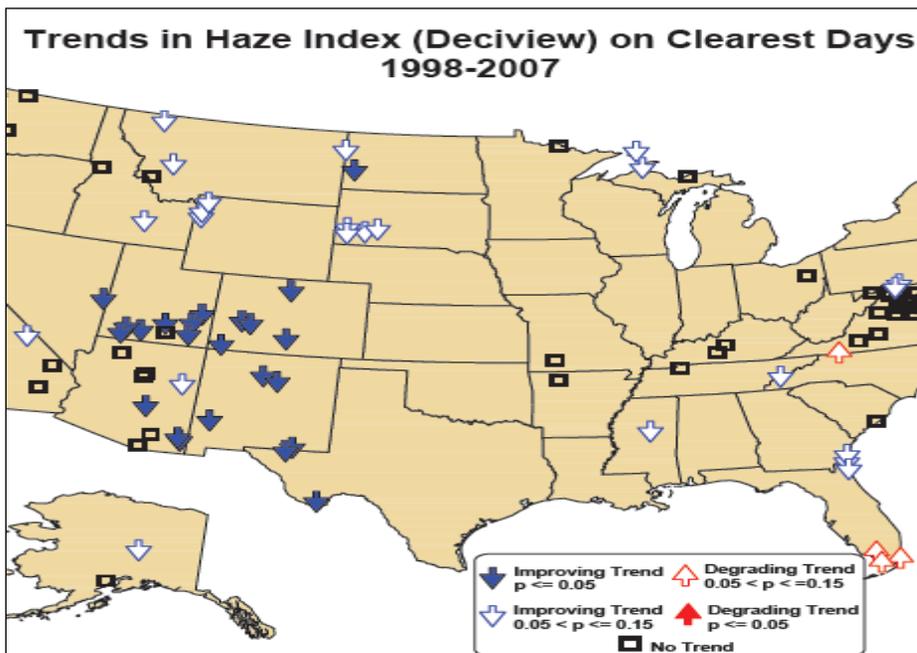


Figure 3.2.1.3. Trends in haze index (deciview) on clearest days, 1998-2007.

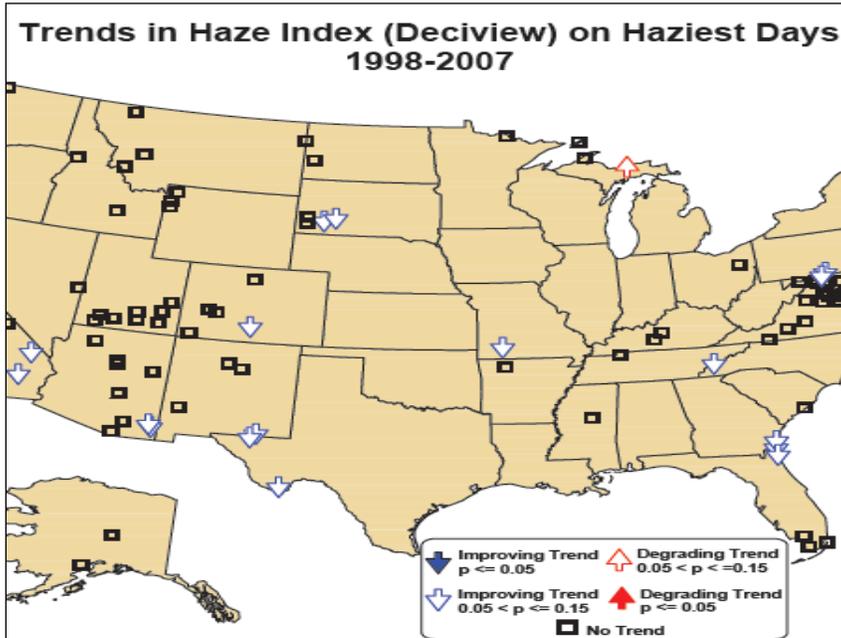


Figure 3.2.1.4. Trends in haze index (deciview) on haziest days, 1998-2007.

The AQI data in Table 3.2.1 show that there is little risk to the general public from air quality in North Dakota (99 percent of the days are rated “good” with 1 percent being “moderate”). While PM_{2.5} does pose a slightly elevated health risk in Cass County (in far eastern North Dakota where there is no surface or subsurface BLM management responsibility), the risk is very short-term occurring about one day per year.

Table 3.2.1 US EPA – Air Data Air Quality Index Report							
See http://www.epa.gov/airnow/aqibroch/							
(2004-2009)							
Counties with > 500 acres of BLM managed resources.							
BLM - Surface and Subsurface							
BLM – Subsurface							
County	State	# Days with Data	# Days rated Good	# Days Rated Mod	# Days Rated Unhealthy for Sensitive Groups	# Days Rated Unhealthy	Maxi AQI value
Billings Co	ND	1,681	1,653	28	0	0	80
Burke Co	ND	1,796	1,780	16	0	0	80
Burleigh Co	ND	1,367	1,340	26	1	0	102
Cass Co	ND	1,794	1,721	67	3	3	162
Dunn Co	ND	1,793	1,783	10	0	0	77

McKenzie Co	ND	1,796	1,760	36	0	0	87
McLean Co	ND	1,168	1,168	0	0	0	27
Mercer Co	ND	1,796	1,762	34	0	0	77
Oliver Co	ND	1,795	1,786	9	0	0	71
Williams Co	ND	1,727	1,720	7	0	0	55
Morton Co	ND	366	361	5	0	0	56
N.Dak Totals		17,079	16,834	238	4	3	
N.Dakota Percentages			99 percent	1 percent	0 percent	0 percent	

In 2008 lands within the NDFO were in compliance with all air quality standards. The following information presents the worst case scenario as they reflect the highest recorded monitoring data from across the state. This includes the more populated areas, such as Cass County, where there is no BLM management responsibility. Sulfur Dioxide reached 55.3 percent of the standard (one hour); nitrogen dioxide reached 10.9 percent; carbon monoxide reached 18.5 percent (one hour), Ozone reached 82.6 percent, PM_{2.5} reached 68 percent (24-hour), and PM₁₀ reached 72 percent of the standard. This indicates that current air quality is very good, falling well below applicable standards.

3.2.2 Climate Change

Climate change is defined by the Intergovernmental Panel on Climate Change (IPCC) as “a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and persist for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity.” (IPCC 2007a). Climate change and climate science are discussed in detail in the Climate Change Supplementary Information Report(SIR) for Montana, North Dakota, and South Dakota, Bureau of Land Management (Climate Change SIR 2010). This document is incorporated by reference into this EA.

The Intergovernmental Panel on Climate Change (as cited in Climate Change SIR, 2010) states, “Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.” Global average temperature has increased approximately 1.4°F since the early 20th century (Climate Change SIR, 2010). Warming has occurred on land surfaces, oceans and other water bodies, and in the troposphere (lowest layer of earth’s atmosphere, up to 4-12 miles above the earth). Other indications of global climate change described by IPCC 2007b (Climate Change SIR, 2010) include:

- Rates of surface warming increased in the mid-1970s and the global land surface has been warming at about double the rate of ocean surface warming since then;
- Eleven of the last 12 years rank among the 12 warmest years on record since 1850;
- Lower-tropospheric temperatures have slightly greater warming rates than the earth's surface from 1958-2005.

As discussed and summarized in Climate Change SIR (2010), earth has a natural greenhouse effect wherein naturally occurring gases such as water vapor, carbon dioxide CO₂, methane(CH₄), and nitrous oxide N₂O absorb and retain heat. Without the natural greenhouse effect, earth would be approximately 60°F cooler (Climate Change SIR, 2010). Current ongoing global climate change is believed by scientists to be linked to the atmospheric buildup of greenhouse gases (GHGs), which may persist for decades or even centuries. Each GHG has a global warming potential that accounts for the intensity of each GHG's heat-trapping effect and its longevity in the atmosphere (summarized in Climate Change SIR, 2010). The buildup of GHGs such as CO₂, methane, N₂O, and halocarbons since the start of the industrial revolution has substantially increased atmospheric concentrations of these compounds compared to background levels. At such elevated concentrations, these compounds absorb more energy from the earth's surface and re-emit a larger portion of the earth's heat back to the earth rather than allowing the heat to escape into space than would be the case under more natural conditions of background GHG concentrations.

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, and 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. For example, CO₂ may last 50 to 200 years in the atmosphere while methane has an average atmospheric life time of 12 years (Climate Change SIR, 2010).

North Dakota, Montana, and South Dakota are all in the lower third of GHG-emitting states (by volume). North Dakota ranks 37, Montana ranks 42, and South Dakota ranks 43. Only Hawaii and Idaho have lower emissions than Montana and South Dakota among western states (http://assets.opencrs.com/rpts/RL34272_20071205.pdf, Ramseur 2007). Montana, North Dakota, South Dakota combine for 1.8 percent of the United States' (U.S.) greenhouse gas emissions.

Some information and projections of impacts beyond the project scale are becoming increasingly available. Chapter 3 of the Climate Change SIR (2010) describes impacts of climate change in detail at various scales, including the state scale when appropriate. The following bullet points summarize potential changes identified by the EPA (EPA, 2008) that are expected to occur at the regional scale, where the proposed action and its alternatives are to take place. The EPA identifies this area as part of the Mountain West and Great Plains

(<http://www.epa.gov/Region8/climatechange/pdf/ClimateChange101FINAL.pdf>):

- The region is expected to experience warmer temperatures with less snowfall.
- Temperatures are expected to increase more in winter than in summer, more at night than in the day, and more in the mountains than at lower elevations.
- Earlier snowmelt means that peak stream flow would be earlier, weeks before the peak needs of ranchers, farmers, recreationists, and others. In late summer, rivers, lakes, and reservoirs would be drier.
- More frequent, more severe, and possibly longer-lasting droughts are expected to occur.
- Crop and livestock production patterns could shift northward; less soil moisture due to increased evaporation may increase irrigation needs.
- Drier conditions would reduce the range and health of ponderosa and lodgepole pine forests, and increase the susceptibility to fire. Grasslands and rangelands could expand into previously forested areas.
- Ecosystems would be stressed, and wildlife such as the mountain lion, black bear, long-nose sucker, marten, and bald eagle could be further stressed.

Other impacts could include:

- Increased particulate matter in the air as drier, less-vegetated soils experience wind erosion.
- Shifts in vegetative communities which could threaten plant and wildlife species.
- Changes in the timing and quantity of snowmelt which could affect both aquatic species and agricultural needs.

Projected and documented broad-scale changes within ecosystems of the U.S. are summarized in the Climate Change SIR (2010). Some key aspects include:

- Large-scale shifts have already occurred in the ranges of species and the timing of the seasons and animal migrations. These shifts are likely to continue (Climate Change SIR, 2010). Climate changes include warming temperatures throughout the year and the arrival of spring an average of 10 days to two weeks earlier through much of the U.S. compared to 20 years ago. Multiple bird species now migrate north earlier in the year.

- Fires, insect epidemics, disease pathogens, and invasive weed species have increased, and these trends are likely to continue. Changes in timing of precipitation and earlier runoff increase fire risks.
- Insect epidemics and the amount of damage that they may inflict have also been on the rise. The combination of higher temperatures and dry conditions have increased the western U.S. and Canada. Warmer winters allow beetles to survive the cold season, which would normally limit populations, while concurrently, drought weakens trees, making them more susceptible to mortality due to insect attack.

More specific to North Dakota, additional projected changes associated with climate change described in Section 3 of the Climate Change SIR (2010) include:

- Temperature increases in North Dakota are predicted to be between 3 to 5°F at mid-21st century and between 5 to 10°F at the end of the 21st century over most of the state. As the mean temperature rises, more heat waves are predicted to occur. In the late 21st century, the number of days per year with temperatures above 100°F is predicted to be between 10 and 45, depending on the level of GHG emissions, with the largest increase in the number days over 100°F occurring in the southern portion of the state.
- Precipitation increases are predicted to be 15-20 percent, and 20-30 percent in spring in North Dakota by the late 21st century. Precipitation is also predicted to decrease slightly in summer, and remain relatively unchanged in the fall.
- For the western portion of the state, annual median runoff is expected to decrease between 2 and 5 percent by mid-21st century, while runoff in the northeastern part of the state would increase by 5-10 percent.
- Crop yields may increase in North Dakota, associated with predicted temperature increases.
- North Dakota's Prairie Pothole wetlands are expected to decline in quality, due to their shallow depths and rapid evaporation rates. Shrinking wetlands may lead to decreases in waterfowl populations.
- Wildland fire risk is predicted to continue to increase due to climate change effects on temperature, precipitation, and wind. One study predicted an increase in median annual area burned by wildland fires in the western portion of North Dakota, based on a 1°C global average temperature increase, to be 393 percent.

While long-range regional changes might occur within this project area, it is impossible to predict precisely when they could occur. The following example summarizing climate data for the West North Central Region (MT, ND, SD, WY) illustrates this point at the regional scale. A potential regional effect of climate change is earlier snowmelt and associated runoff. This is directly related to springtime temperatures.

Over a 112-year record, overall warming is clearly evident with temperatures increasing 0.21 degrees per decade (Figure 3.2.2.1). This would suggest that runoff may be occurring earlier than in the past. However, data from 1991-2005 indicates a 0.45 degree per decade cooling trend (Figure 3.2.2.2). This example is not an anomaly, because several other 15-year windows can be selected to show either warming or cooling trends. Some of these year-to-year fluctuations in temperature are due to natural processes, such as the effects of El Niños, La Niñas, and the eruption of large volcanoes (summarized in Climate Change SIR, 2010). This information illustrates the difficulty of predicting actual regional or site-specific changes or conditions which may be due to climate change during any specific time frame.

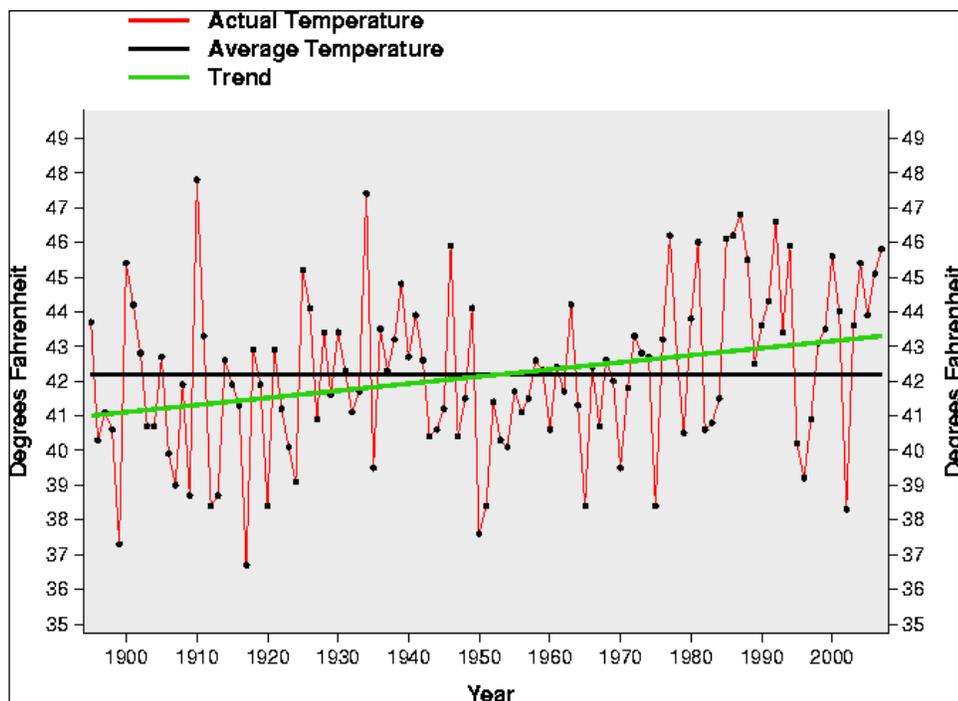


Figure 3.2.2.1. Regional climate summary of spring temperatures (March-May) for the West North Central Region (MT, ND, SD, WY), from 1895-2007. (Source: NOAA website – <http://www.ncdc.noaa.gov/oa/climate/research/cag3/wn.html>)

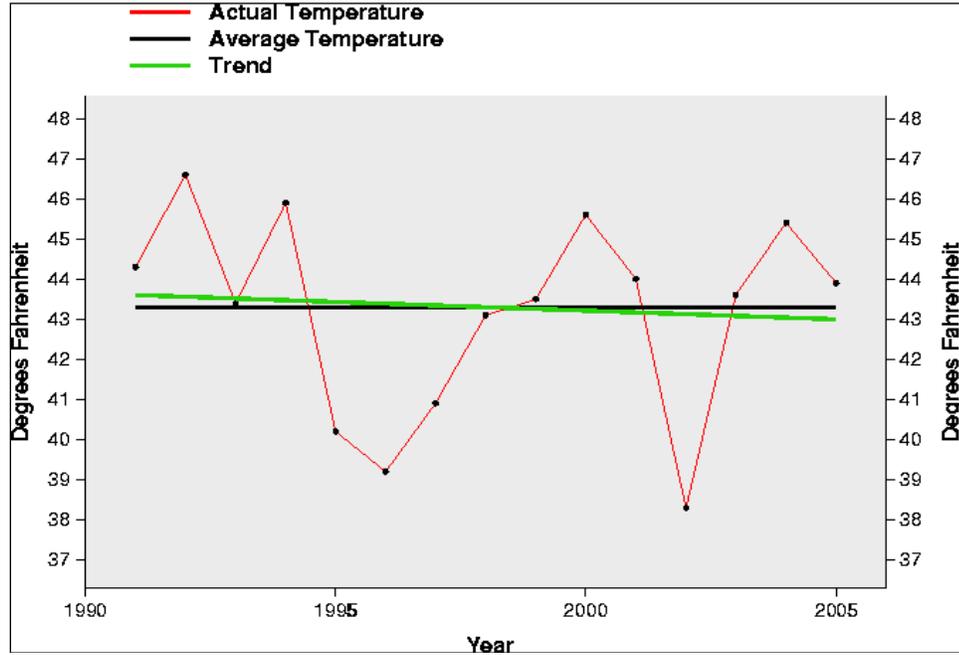


Figure 3.2.2.2. Regional climate summary of spring temperatures (March-May) for the West North Central Region (MT, ND, SD, WY), from 1991-2005. (Source: NOAA website – <http://www.ncdc.noaa.gov/oa/climate/research/cag3/wn.html>)

3.3 Soil Resources

The west-central part of the state is covered with drift remnants of glacial till. Topography in this area is undulating to strongly rolling (3-15 percent slopes) with extensive areas of hilly and steep slopes (greater than 15 percent) along Lake Sakakawea (the Missouri River Breaks) and some of the tributaries of the Missouri River, (e.g., Knife River). These soils have formed in the shale and sandstone (Cabba, Morton), alluvium in potholes and depressions (Parnell, Tonka), and glacial till (Williams, Bowbells, Zahl) (NDFO RMP, 1988).

The proposed lease area includes many soil types and complexes, including several that are sensitive and that could be adversely impacted by oil and gas-related activities. These types include those that have high erosion ratings, those with steep slopes, and those with limitations related to construction activities and reclamation.

3.4 Water Resources

Hydrology – Surface Water Quality

None of the parcels contain perennial or intermittent streams that have been identified as impaired by the North Dakota Department of Health.

Hydrology – Ground Water

The quality and availability of ground water varies greatly across the three-state region (Montana, North Dakota, and South Dakota). Aquifers in western Montana are typically in unconsolidated, alluvial valley-fill materials within intermontane valleys. The intermontane valley aquifers often yield relatively large quantities of high quality water compared to relatively shallow water wells. Because many wells are being constructed in these aquifers as development encroaches, fractured bedrock aquifers surrounding the intermontane valleys are becoming important. Residents in eastern Montana and the Dakotas commonly get their ground water from aquifers consisting of unconsolidated, alluvial valley-fill materials, glacial outwash, or consolidated sedimentary rock formations. Aquifers that residents most commonly used in this area include the Fort Union, Hell Creek, Fox Hills, Judith River, and Eagle consolidated formations. In some areas east of the Rocky Mountains, near-surface thick shale deposits such as those of the Colorado Group and Bearpaw (Pierre) Shale severely limit the economic availability of water to wells or provide water of quality too poor for most uses.

3.5 Vegetation Resources

As described in the Introduction to this EA, all the lease parcels are located in western North Dakota, which is located in the Northern Mixed Grass Prairie. The Northern Mixed Grass Prairie is known for its diverse vegetation types, soil types, and topography. Vegetation is comprised of both tall and short grass as well as both warm and cool season grasses. A variety of grass-like plants, forbs, shrubs, and trees also add to the vegetation diversity of this rangeland type. Many of these plant species are found in woody draws and riparian/wetland zones.

3.5.1 Vegetation Communities

Six major vegetation communities have been identified for the study area: native mixed grass prairie, wooded draws, agricultural lands, improved or restored pastures, riparian-wetlands, and other disturbed vegetative communities.

As a whole, the North Dakota landscape is comprised of a mosaic pattern. Settlement and privatization of most of the state has led to this pattern; therefore, large blocks of vegetative communities free of human disturbances are rare.

Native Mixed Grass Prairie

The native mixed grassland community is dominated by perennial grasses. Perennial grasses can be both warm season and cool season grasses, and they can also be both tall and short grasses. Some of the more common grasses include: western wheatgrass (*Pascopyrum smithii*), needle-and-thread (*Hesperostipa comata*), green needlegrass (*Nassella viridula*), blue grama (*Bouteloua gracilis*), and prairie junegrass (*Koeleria macrantha*). Various forbs and shrubs are present but occur as a minor species

composition component throughout the community. Many of these species occur in woody draws.

Wooded Draw

The wooded draw habitat type develops in ravines where the microclimate, primarily greater moisture, is suitable for the growth and development of trees. The major species include green ash, American elm, cottonwood, and quaking aspen. Wooded draws also support a variety of shrub species including chokecherry, American plum, western snowberry, buffaloberry, red-osier dogwood, Missouri gooseberry, and juneberry. (North Dakota RMP/EIS, 1988).

Improved or Restored Pasture

Improved pastures consists of cultivated areas planted with introduced forage species, including crested wheatgrass and smooth brome (*Bromus inermis*) and intermediate wheatgrass (*Thinopyrum intermedium*) and alfalfa (*Medicago sativa*), planted specifically for the improved forage production for livestock consumption.

Restored pastures may include sub-marginal agricultural lands that have been restored due to poor crop production and/or high erosion potential. Historically, restored pastures were dominated by a monoculture of crested wheatgrass. These crested wheatgrass seedings are still present today and are essentially unchanged from when they were planted. They can be visible on aerial photographs, and grass, forb, and shrub species composition are similar from one crested seeding to another. More recent restoration activities of agricultural lands use a combination of crested wheatgrass, smooth brome, intermediate wheatgrass, or species native to Northern Mixed Grass Prairie.

Agriculture

The agriculture community is comprised of monocultures of crops which may include small grains, alfalfa, corn, sunflowers, or other crops grown primarily as supplemental feed sources for livestock production operations. These areas have been completely disturbed from the native vegetation potentials.

Riparian-Wetlands

Riparian-wetland areas are among the most productive and important ecosystems, comprising approximately one percent of all national public lands. Characteristically, riparian-wetland areas display a greater diversity of plant, fish, wildlife, and other animal species and vegetative structure than adjoining ecosystems. Some of the more common vegetative species that occur in these areas include: prairie cordgrass, switchgrass, Canada wildrye, western wheatgrass, sedges (*Carex spp.*), rushes (*Juncus spp.*), willow, chokecherry, buffaloberry, and plains cottonwood. Healthy riparian systems filter and purify water as it moves through the riparian-wetland zone, reduce sediment loads and

enhance soil stability, provide micro-climate moderation when contrasted to temperature extremes in adjacent areas, and contribute to ground water recharge and base flow (USDI, BLM, 1987b).

Prairie potholes are depressional wetlands created by the scouring action of glaciers. The formerly glaciated landscape within the study area is pockmarked with a number of these potholes, which fill with snowmelt and rain in the spring. Some prairie pothole marshes are temporary, while others may be essentially permanent. Submerged and floating aquatic plants take over the deeper water in the middle of the potholes, while bulrushes and cattails grow closer to shore.

Other Disturbed Vegetation Communities

Other disturbed vegetation communities include human disturbances or alterations to the landscape. These disturbances include, but are not limited to: infrastructure developments (e.g., roads, powerlines, pipelines, and fences), chemical applications, livestock grazing, farming and ranching, and industrial and commercial facilities. Invasive, non-native grasses such as smooth brome and crested wheatgrass are commonly found on these disturbed areas. For example, smooth brome was planted in many road ditches and has encroached into areas bordering road ditches. This is often true for native prairie sites adjacent to roadways; therefore, these sites often have a smooth brome component due to its ability to spread by creeping rhizomes.

Wildfire prevention, manipulation, and suppression activities are also human alterations on natural processes that have altered vegetation communities in western North Dakota.

3.5.2 Noxious Weeds

Noxious weeds occur randomly in isolated pockets within the study area. No known populations are located within the parcels, but all of North Dakota has the potential for infestation. The following table (Table 3.5.2.1) shows the noxious weeds in North Dakota.

Common Name	Scientific Name
Absinth wormwood	<i>Artemisia absinthium</i>
Canada thistle	<i>Cirsium arvense</i>
Dalmatian toadflax	<i>Linaria genistifolia</i>
Diffuse knapweed	<i>Centaurea diffusa</i>
Field bindweed	<i>Convolvulus arvensis</i>
Leafy spurge	<i>Euphorbia esula</i>
Musk thistle	<i>Carduus nutans</i>
Purple loosestrife	<i>Lythrum salicaria</i>

Russian knapweed	<i>Acroptilon repens</i>
Saltcedar	<i>Tamarix ramosissima</i>
Spotted knapweed	<i>Centaurea maculosa</i>

Table 3.5.2.1. Noxious weeds in North Dakota

3.6 Special Status Species

3.6.1 Special Status Animals Species

A number of animal species are priority species for BLM and could be found occupying habitats associated with the proposed lease nominations. Special status species (SSS) are species that are limited in number or that have observed a steady decline in their numbers across their range.

The **Special Status Species** designation includes **sensitive** and state listed as well as federally **proposed, listed, and candidate** species.

Sensitive species are those designated as sensitive by a BLM state director, usually in cooperation with the state agency responsible for managing the species and state natural heritage programs. They are those species that: (1) could become endangered in or extirpated from a state or within a significant portion of its distribution; (2) are under status review by the U.S. Fish and Wildlife Service (FWS); (3) are undergoing significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution; (4) are undergoing significant current or predicted downward trends in population or density such that federal listed, proposed, candidate, or state-listed status may become necessary; (5) typically have small and widely dispersed populations; (6) inhabit ecological refugia or other specialized or unique habitats; or (7) are state-listed but which may be better conserved through application of the BLM Sensitive Species Status.

State Listed (or Species of Conservation Priority) this designation includes species in decline at the state level whose population levels are not well known but are thought to be in decline.

Proposed species are species that have been officially proposed for listing as threatened or endangered by the Secretary of the Interior, and a proposed rule has been published in the Federal Register.

Listed species are designated as threatened or endangered by the Secretary of the Interior under the provisions of the Endangered Species Act, and a final rule for the listing has been published in the Federal Register.

Candidate species are designated as candidates for listing as threatened or endangered by the FWS, and listings have been published in the Federal Register.

3.6.1.1 Aquatic Wildlife

The analysis area contains sufficient habitat for five fish, one amphibian, and one reptile that are special status species. All of these species depend on perennial and intermittent streams or rivers with intact floodplains, wetlands and riparian areas that are properly functioning. Threats to the aquatic species include but are not limited to habitat modification, small population size, limited natural reproduction, hybridization, pollution and contaminants.

Species	USFWS Status	BLM Sensitive	In Range	Suitable Habitat present
Blue sucker	none	Sensitive	Yes	Yes
Northern Redbelly X Finescale Dace	none	Sensitive	Yes	Yes
Paddlefish	none	Sensitive	Yes	Yes
Sicklefin chub	none	Sensitive	Yes	Yes
Sturgeon Cub	none	Sensitive	Yes	Yes
Snapping Turtle	none	Sensitive	Yes	Yes
Plains spadefoot	none	Sensitive	Yes	Yes

Table 3.6.1. Aquatic sensitive or specials status wildlife species in the analysis area

3.6.1.2 Terrestrial Wildlife

Evaluation of wildlife values at the landscape scale as a first step is key to understanding potential impacts of a large project. Various agencies and non-governmental organizations have evaluated wildlife values, including terrestrial conservation species, species richness, game quality, etc. and have been mapped to various degrees at the landscape level.

Lease parcels were reviewed utilizing these GIS overlays to assess potential aquatic, terrestrial and other habitat values. This course-scale landscape analysis of wildlife resources provides one tool for understanding the context of the wildlife values at a large scale. Fine-scaled tools, data, and resource information based on inventory and monitoring data, as well as local knowledge from BLM and NDGF employees, are used to further examine resource issues at the site-specific level.

The analysis area covers a wide variety of habitat consistent with the Northern Great Plains. Lease parcels are located within sagebrush grasslands, short and mixed grass prairies, riparian and woody draw habitats, wetland habitats and others. See section 3.5 for a detailed description of vegetation.

Grassland Birds

Several of the proposed lease nomination areas provide excellent habitat for a suite of sensitive bird species associated with northern mixed-grass and short-grass prairie habitats. The mixed-grass prairie contains both warm season grasses and cool season grasses such as blue grama, needle-and-thread, prairie junegrass, western snowberry, and western wheatgrass.

Some of the more common species which depend on these habitats are: Swainson’s hawk (*Buteo swainsoni*), ferruginous hawk (*Buteo regalis*), golden eagle (*Aquila chrysaetos*), long-billed curlew (*Numenius americanus*), marbled dodwit (*Limosa fedoa*), burrowing owl (*Athene cunicularia*), Sprague’s pipit (*Anthus spragueii*), Le Conte’s sparrow (*Ammodramus leconteii*), Baird’s sparrow (*Ammodramus bairdii*), logger-head shrike (*Lanius ludovicianus*), black tern (*Chlidonias niger*), Nelson’s sharp-tailed sparrow (*Ammodramus nelsonii*), willet (*Catoptrophorus semipalmatus*), Wilson’s phalarope (*Phalaropus tricolor*), and the yellow rail (*Coturnicops noveboracensis*). [see table 3.6.2 for a complete list]

Most birds found within the analysis area are migratory. Populations of some of these species are declining as a consequence of land use practices and other factors. Many species of grassland birds nest and raise their young on these lease parcels. Neo-tropical migrants exhibit quite variable habitat requirements and are found in most habitat types.

Mammals and Reptiles

Four sensitive species of mammals and three species of reptiles have the potential to be found within the analysis area. Several species of bats which are commonly found in close relation to conifer stands and rocky outcroppings, prairie dogs and the swift fox completes the list. Swift fox sightings were last observed in Mercer and Golden Valley Counties in 1976 and 1990 respectively.

Birds	Scientific Name	Global Rank	State Rank	NDGF Rank
Baird’s Sparrow	<i>Ammodramus bairdii</i>	G4	SU	Level 1
Black Tern	<i>Chlidonias niger</i>	G4	SU	Level 1
Brewer’s Sparrow	<i>Spizella breweri</i>	G5	S3	Level 3
Burrowing Owl	<i>Athene cunicularia</i>	G4	SU	Level 2

Chestnut-collared Longspur	<i>Calcarius ornatus</i>	G5	SU	Level 1
Common Loon	<i>Gavia immer</i>	G5	S4	Not Ranked
Dickcissel	<i>Spiza americana</i>	G5	SU	Level 2
Ferruginous Hawk	<i>Buteo regalis</i>	G4	SU	Level 1
Franklin's Gull	<i>Larus pipixcan</i>	G4, G5	SU	Level 1
Golden Eagle	<i>Aquila chrysaetos</i>	G5	S3	Level 2
Greater Sage-grouse	<i>Centrocercus urophasianus</i>	G4	SU	Level 2
Le Conte's Sparrow	<i>Ammodramus leconteii</i>	G4	SU	Level 2
Loggerhead Shrike	<i>Lanius ludovicianus</i>	G4	SU	Level 2
Long-billed Curlew	<i>Numenius americanus</i>	G5	S2	Level 1
Marbled Godwit	<i>Limosa fedoa</i>	G5	SU	Level 1
McCown's Longspur	<i>Calcarius mccownii</i>	G4	S2	Level 3
Nelson's Sharp-tailed Sparrow	<i>Ammodramus nelsonii</i>	G5	SU	Level 1
Northern Goshawk	<i>Accipiter gentilis</i>	G5	SU	Not Ranked
Peregrine Falcon	<i>Falco peregrinus</i>	G4, T4	S1	Level 3
Sedge Wren	<i>Cistothorus platensis</i>	G5	SU	Level 2
Sprague's Pipit	<i>Anthus spragueii</i>	G4	S3	Level 1
Swainson's Hawk	<i>Buteo swainsoni</i>	G5	SU	Level 1
White-faced Ibis	<i>Plegadis chihi</i>	G5	SU	Not Ranked
Willet	<i>Catoptrophorus semipalmatus</i>	G5	SU	Level 1
Wilson's Phalarope	<i>Phalaropus tricolor</i>	G5	SU	Level 1
Yellow Rail	<i>Coturnicops noveboracensis</i>	G4	S2	Level 1
Snapping Turtle	<i>Chelydra serpentine</i>	G5	n/a	Level 2
Western Hog-nosed snake	<i>Heterodon nasicus</i>	G5	n/a	Level 3
Long-legged myotis	<i>Myotis volans</i>	G5	n/a	Level 3
Long-eared myotis	<i>Myotis evotis</i>	G5	n/a	Level 3
Black-tailed Pr. Dog	<i>Cynomys ludovicianus</i>	G4	n/a	Level 1
Swift Fox	<i>Vulpes velox</i>	G3	S1	Level 2

Table 3.6.2. presents sensitive bird/mammal/reptile species found in North Dakota and includes their global, state, and North Dakota Game and Fish (NDGF) ranks.

The State of North Dakota employs the standardized ranking system to denote global (or range-wide) and state status (Nature Serve, 2006). NDGF assigns numeric ranks ranging from 1 (highest risk, greatest concern) to 5 (demonstrably secure), reflecting the relative degree of risk to the species' viability, based on available information.

3.6.2.1 Threatened, Endangered, Candidate, and Proposed Species

Threatened, endangered, candidate, or proposed bird species may occupy habitat infrequently or seasonally within the analysis area. These species include:

- Interior Least Tern--*Sterna antillarum athalassos* (Endangered)
- Whooping Crane--*Grus Americana* (Endangered)
- Piping Plover --*Charadrius melodus* (Threatened)
- Pallid Sturgeon-- *Scaphirhynchus albus* (Endangered)
- Dakota Skipper Butterfly-- *Hesperia dacotae* (Candidate)
- Greater Sage Grouse-- *Centrocercus urophasianus* (Candidate)
- Sprague's pipit--*Anthus spraguii* (Candidate)

The Black-footed Ferret (*Mustela nigripes*) is not known to occur within the planning area. Occasional sightings of Gray Wolves (*Canis lupis*) have been reported, but no documented home range has been identified.

Interior Least Tern

The interior least tern was listed as endangered in 1985. From mid-May to mid-August, interior least terns use sparsely vegetated sandbars or shoreline salt flats of lakes along the Missouri River system including Lake Sakakawea. They do not breed on any other water body or waterway in North Dakota.

Whooping Crane

The whooping crane was listed as endangered in 1967. North Dakota lies directly in the middle of the major migratory path utilized by the remaining wild bird population. Sightings have been recorded in all the counties within the study area with the exception of McKenzie and Bowman counties. Palustrine wetland and cropland ponds are used during the migration for feeding and roosting. There has not been any recording nesting activity in North Dakota for more than 90 years. Recovery actions to protect and restore whooping cranes are outlined in the 2005 FWS Recovery Plan and can be found at: (http://ecos.fws.gov/docs/recovery_plan/070604_v4.pdf)

Piping Plover

Preferred habitat for the piping plover is generally characterized as exposed, sparsely vegetated shores and islands of shallow alkali lakes and impoundments. Salt-encrusted, alkali, or sub-saline semi-permanent lakes, ponds, and rivers with wide shorelines of gravel, sand, or pebbles are preferred.

The piping plover was listed as threatened in 1985. Critical habitat was designated in North Dakota in 2002 for the entire Lake Sakakawea boundary, the Missouri River as well as areas in Mountrail, Williams, Ward and Burke counties. Several parcels were identified as having critical habitat associated with them. The FWS estimated approximately 2,000 breeding pairs were located in North Dakota in 1993, compared to 11,000 breeding pairs in 1967 (<http://www.fws.gov/mountain-prairie/species/birds/pipingplover/>)

Pallid Sturgeon

The pallid sturgeon was listed in 1990. Pallid sturgeons are found in the upper reaches of the Missouri River in North Dakota near the confluence with the Yellowstone River and in the Yellowstone River proper. However, the confluence is continuous with Lake Sakakawea, and this species may be found throughout the entire system. The pallid sturgeon is adapted for living close to the bottom on sand flats and gravel bars of large, silty rivers with swift currents.

Dakota Skipper Butterfly – Candidate Species

Dakota Skipper Butterfly – Candidate Species

The Dakota skipper butterfly species may occupy habitat infrequently or seasonally within the analysis area, however, due to their vary specific habitat requirements they are not known to occupy any nominated lease parcels. The following counties in the analysis area have recorded sightings: Burke, Bottineau, Dunn, McHenry, McKenzie, Mountrail, and Ward.

The Dakota skipper is a small to medium-sized hesperiine butterfly associated with high quality prairie ranging from wet-mesic tall grass prairie to dry mesic mixed grass prairie. The first type of habitat is relatively flat and moist native bluestem prairie. These species of wildflowers are usually present: wood lily (*Lilium philadelphicum*), harebell (*Campanula rotundifolia*), and smooth camas (*Zygadenus elegans*). The second habitat type is upland (dry) prairie that is often on ridges and hillsides. Bluestem grasses and needlegrasses dominate these habitats. On this habitat type, three wildflowers are typically present in high quality sites that are suitable for Dakota Skipper: pale purple (*Echinacea pallida*) and upright (*E. angustifolia*) coneflowers and blanketflowers (*Gaillardia sp.*) and survive only in undisturbed, tall grass and mid-grass prairie. In the western part of North Dakota, the skipper may be found in ungrazed native pastures.

Bluestem grass is a favorite food plant for the larval stage of the skipper. Dakota skippers rarely travel more than one-half mile in their entire lifetime.

Sprague's Pipit – Candidate Species

A 12 month finding for the Sprague's Pipit was published in the Federal Register by the Fish and Wildlife Service (USFWS) on September 15, 2010, warranting the listing of the Sprague's Pipit as a Federal protected species, but precluded the listing due to higher priority species. The species is currently on the candidate species list.

The Sprague's pipit is a relatively small (4–6 inches long and weighs 0.8-0.9 ounces) passerine endemic to the North American grasslands. It has a plain buff colored face with a large eye-ring. The Sprague's pipit is a ground nester that requires grassland habitats, preferably larger non-fragmented undisturbed habitat, at least 80 acres in size. It feeds mostly on insects, spiders, and some seeds.

Sprague's pipits are strongly tied to native prairie (land which has never been plowed) throughout their life cycle (Owens and Myres 1973, pp. 705, 708; Davis 2004, pp. 1138-1139; Dechant et al. 1998, pp. 1-2; Dieni et al. 2003, p. 31; McMaster et al. 2005, p. 219). They are rarely observed in cropland (Koper et al. 2009, p. 1987; Owens and Myres 1973, pp. 697, 707; Igl et al. 2008, pp. 280, 284) or land in the Conservation Reserve Program (a program whereby marginal farmland is planted primarily with grasses) (Higgins et al. 2002, pp. 46-47). Vegetation structure may be a better predictor of occurrence than vegetation composition (Davis 2004, pp. 1135, 1137).

Potential habitats for the Sprague's Pipit exist throughout western North Dakota.

Greater Sage Grouse – Candidate Species

On March 5, 2010, USFWS concluded sage grouse warrants protection under the Endangered Species Act. However, USFWS determined the listing of the species is precluded by the need to take action on higher priority species. Sage grouse was placed on the list of species that are candidates under the Endangered Species Act.

Sage grouse are a native prairie grouse species that are considered sagebrush obligates and depend on sagebrush for survival. In addition to sagebrush grasslands, sage grouse may also use mesic areas during brood rearing or during the summer/late summer season for habitat. Sage grouse habitat delineations have been developed for the sage grouse conservation alternatives being considered in the future NDFO RMP planning effort. This delineation effort resulted in the identification of sage grouse habitat characteristics important to the conservation of the species. These characteristics may include nesting habitat, brood rearing habitat, winter habitat, and connectivity to those habitats. Sage

grouse are only found in Bowman, Slope and southern Golden Valley counties in North Dakota.

Bowman County has three parcels nominated that are located in Sage Grouse Core habitat as defined by BLM and North Dakota Game and Fish Department. These three parcels are located in close proximity to known active and/or historic leks and contain significant sage grouse habitat.

3.6.2 Special Status Plant Species

There are no known threatened or endangered plant species in the study area and no special status plant species identified for North Dakota.

3.7 Fish and Wildlife

A diversity of wildlife habitat, topography, and vegetation types exists across the analysis area. This diversity across western North Dakota and the analysis area provides habitat for many wildlife species in addition to those previously mentioned.

Current and historic land uses across the lease parcels include grazing, farming, hunting, energy development, and others. Consequently, some areas contain large contiguous blocks of well-functioning habitats, while other areas are composed of small, fragmented patches of native habitats. In some areas, existing anthropogenic disturbance at some frequency has been attributed to reducing habitat suitability for some species of wildlife intolerant to human activities.

Wildlife species and habitat surveys have been conducted throughout the analysis area at various times and for various species. The entire area has not been comprehensively surveyed for all wildlife resources; however, a combination of past surveys provides insight into what species have been documented, and what other species are expected within those habitat types.

Big game species in the analysis area include mule deer, white-tailed deer, pronghorn antelope, and elk.

White-tailed deer are the most abundant big game species and use the greatest variety of habitats, generally preferring riparian corridors, along creeks and rivers, as well as woody draws and grasslands (NDGF web site). Habitat diversity appears to be a good indicator of intensity of deer use. In mule deer habitats, diversity of vegetation usually followed topographic diversity; thus, rugged topography may be the ultimate factor influencing mule deer use of an area (Mackie et. al, 1998).

Winter range is often part of year-round habitat in western North Dakota. Winter ranges are typically in areas of rougher topography and are often dominated by shrub species that provide crucial browse during winter months. Escape and thermal cover are also important for maintenance and survival. Thick stands of ponderosa pine and juniper are examples of important escapes and thermal cover used by mule deer in the analysis area while woody draws, shelterbelts and farmsteads provide winter cover for white-tailed deer.

Pronghorn antelope are sparsely distributed across the analysis area with Bowman County being the core area. They are generally associated with grasslands and shrublands, but they will also use agricultural fields. Winter ranges for pronghorn antelope generally occur within sagebrush grasslands with at least greater densities of big sagebrush than the surrounding areas.

Elk are primarily associated with the timbered portion of the breaks and the riparian bottoms along the river corridors. The riparian areas are used in conjunction with the upland areas for forage and security purposes. The riparian bottoms become increasingly important during the drought periods when upland reservoirs become dry.

The potential for big game movements or migrations through western North Dakota are not fully understood. At a local level, it is reasonable to assume big game movements occur at least seasonally. Migration corridors have not been identified through any of the lease parcels.

The analysis area provides habitat for sharp-tailed grouse, turkeys, Hungarian partridge, and pheasants.

In addition to sage grouse, sharp-tailed grouse are the other native prairie grouse species in the analysis area. Sharp-tailed grouse generally prefer hardwood draws, riparian areas, and prairie grasslands intermixed with shrubs such as chokecherry and buffaloberry. NDGF survey data on sharp-tailed grouse leks is sporadic throughout much of the study area. No known sharp-tailed grouse leks are located on the existing lease parcels.

Wild turkeys, pheasants, and Hungarian partridge are all species that have been introduced to western North Dakota and would be expected to utilize available habitats within some of the lease parcels.

3.7.1 WATERFOWL

A portion of the lease parcels are north of the Missouri River and fall within the Prairie Pothole Region of North Dakota. Statewide, this region encompasses nearly 37,000 square miles and is one of the most important waterfowl-producing areas within North

America. Region wide, more than half of all the annual duck production in North America occurs within the entire 300,000 square miles of prairie potholes.

From the mid-1950s to the mid-1970s, approximately 458,000 acres per year of wetland habitat was lost to agriculture and drainage within the Prairie Pothole Region. This loss has increased the importance of wetland habitat, even though the study area makes up less than 1/10 percent of the pothole region in North America. While natural wetlands are crucial for waterfowl nesting, reservoirs become increasingly important during the dry years. Often, they are the only water sources for waterfowl during extended drought periods.

Most species of North American waterfowl have been found nesting within the study area, and many of these species are common migrants. Common nesters found here include: mallard (*Anas platyrhynchos*), Canada goose (*Branta canadensis*), gadwall (*Anas strepera*), blue-winged teal (*Anas discors*), and northern shoveler (*Anas clypeata*).

3.7.2 Migratory Bird

As per Executive Order (EO) 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, federal agencies are required to address migratory birds in their management activities. A wide variety of migratory birds occurs in the planning area, and species are generally associated with particular habitat types. Migratory birds of the greatest conservation concern are those with declining population trends and/or those associated with uncommon habitats. As identified by the FWS, there are 28 species of Birds of Conservation Concern in the planning area. The Sprague's pipit and sage grouse are addressed in the earlier part of this section.

3.8 Cultural Resources

The BLM is responsible for identifying, protecting, managing, and enhancing cultural resources which are located on public lands, or that may be affected by BLM undertakings on non-Federal lands, in accordance with the National Historic Preservation Act (NHPA) of 1966, as amended. The procedures for compliance with the NHPA are outlined in regulation under 36 CFR 800. Cultural resources include archaeological, historic, and architectural properties, as well as traditional life-way values and/or traditional cultural properties important to Native American groups.

Common prehistoric archaeological sites in North Dakota include lithic scatters, stone cairns, rock art, short-term camp sites, stone circles (tipi ring camps), earth lodge villages, and Knife River Flint quarries. Also common, but to a lesser degree, are game drives/kill sites, stone alignments, vision quest locations, eagle-trapping pits, and artifact scatters that include ceramics or European trade goods. Of particular importance due to their scientific significance are deeply stratified, multiple-component sites that are

typically found near spring deposits, or along remnant alluvial fans, and stream terraces lining the Missouri and Little Missouri River valleys. Historic sites may include the remains of homesteads, farmsteads, military forts, trading posts, schools, churches, roads, railroad grades, trails, trash dumps, and artifact scatters.

A Class I literature search of records at the North Dakota State Historical Society was conducted for all of the nominated lease parcels and a ½-mile radius to the lease parcels, to determine the amount of previous cultural resources inventory and the presence of previously recorded cultural resources known to occur within or adjacent to the nominated lease parcels (Sakariassen and Peterson 2011). The North Dakota RMP/EIS and the North Dakota Statewide Comprehensive Historic Preservation Plan (North Dakota Historical Society: 2009) was reviewed for additional insight and information on cultural resources in the general area of the lease parcels. In addition, the tribal historic preservation offices and other interested tribes in North Dakota and Montana were consulted for any available information on traditional cultural properties, culturally sensitive areas, or other areas of concern to tribes. The Class I report along with a table of findings was sent to Tribal Chairman and Tribal Historic Preservation Offices on July 13, 2011. Since this report was submitted for review to the Tribes information put forth in the Summary Table has been updated. The updated information incorporates additional cultural resource survey in lease parcels NDM 97300-EH and NDM 97300-IS; one additional cultural resource sites inside parcel NDM 97300-GS; and nine additional cultural resource sites in the ½-mile radius of lease parcels NDM 97300-GS, I0, I8, IS, and IX. This information should be considered corrected and is presented in Appendix A.

Based on the results of the Class I literature review; 14 of the 35 lease parcels being reviewed for Alternatives B and C, have had at least some level of cultural resource inventory survey conducted previously. The previous Class III pedestrian surveys conducted within the proposed lease parcels and in a ½-mile radius, consist primarily of linear surveys with narrow corridor coverage such as for roads and highways; transmission, power, or fiber optic lines; water, gas and oil pipelines; seismic lines, and fences. Other surveys were conducted for small recreation areas and boat ramps; dikes, oil well pads; gravel and borrow pits. Larger scale “block “surveys usually associated with coal mine lease areas, land exchange or acquisitions, or BLM surface tracts, also account for additional survey coverage within the identified lease parcel areas. Based on the review of available information, approximately 1,158 of the total 7,314 acres or 16% of the surface areas within the identified lease parcels have been previously inventoried for cultural resources at the Class III level.

Review of available information indicates that 4 of the 35 nominated lease parcels under review contain 8 previously documented cultural properties. In addition, the examination

of a ½-mile area around each lease parcel indicates that 15 parcels have an additional 26 cultural properties adjacent to the lease parcels. Table 3.8.2 provides a summary of the number and type of previously recorded or known sites located within the boundaries of the lease parcels. Of the 8 sites identified with the boundaries of the lease parcels, 6 sites (75%) have not been formally evaluated for significance or eligibility to the National Register of Historic Places. The remaining two sites have been determined to be not eligible for inclusion to the National Register.

Cultural Resource Site Type	Location & Information
Archaeological Cultural Material Scatter (CMS)	1 inside parcel; 5 in ½-mile radius
Archaeological Lithic Scatter	2 inside parcels; 1 in ½-mile radius
Historic Overhead Transmission Line	2 inside parcels; 1 of them in ½-mile radius also
Historic Rail Road Segment	1 inside parcel (Great Northern Railroad)
Isolated Find (I.F.) Knife River Flint Flakes	1 inside parcel; 2 in ½-mile
Site Lead—Historic Post Office	1 inside parcel (Wilber Post Office)
Stone Circle/Rock Cairns	1 site in ½-mile radius
Archaeological CMS/Occupation (Not Eligible)	6 sites in ½-mile; 1938 Hecker (Unknown Locations)
Historic CMS	1 site in 2 different parcels in the ½-mile radius
Historic Architectural Church/Cemetery	1 site in ½-mile; Writing Rock Lutheran Church
Historic Farmstead, foundations/artifact scatter	3 in ½-mile radius, all unevaluated.
Historic Coal Mine	1 site in ½-mile
Historic Architectural Culvert	1 site in ½-mile
Historic Homesteads	1 site in ½-mile
Isolated Find: Historic Farm Machinery	1 site in ½-mile
I.F., Knife River Flint Biface Stone Tool	1 site in ½-mile

Table 3.8.2. Cultural Resource Types and Numbers inside Lease Parcels and ½-mile Radius

Three of the proposed leases (NDM 97300-IC, ID, and IE) are located along the Missouri River corridor where large block reconnaissance type surveys have been conducted previously. One lease is located along the Little Missouri River (NDM 79010-MR) and two along the Cannon Ball River (NDM 97300-KP and KQ), in areas with a higher probability for cultural resources. Lease parcel NDM 97300-IC has received 10 percent survey in the lease parcel. Four previous cultural resource sites have been identified inside the lease parcel. One additional cultural resource site is known in a ½-mile radius. NDM 97300-ID has received 10 percent survey inside the lease parcel. There are no previously recorded sites inside the parcel and one has been identified in the ½-mile radius. NDM 97300-IE has received 100 percent survey coverage in the lease parcel. No sites have been identified in the lease parcel and 1 cultural resource site is known in the ½-mile radius. NDM 97300-MR has received no previous survey coverage in the lease

parcel and no cultural resources have been identified. NDM 97300-KP has received 10 percent survey coverage in the lease parcel. No sites have been identified in the lease parcel and 1 cultural resource site is known in the ½-mile radius. Less than 5 percent of NDM 97300-KQ has been previously surveyed. One cultural resource site is known inside the lease parcel and no sites are known in the ½-mile radius. Cultural resource sites and previous survey percentages are listed in Table form in Appendix A.

The Bureau of Land Management follows standard procedures for the consideration of potential impacts to cultural resources resulting from Oil and Gas leasing and development projects. These procedures allow for a “phased” approach to the identification and evaluation of cultural properties. A detailed Class I overview of cultural resource information (previous survey and known sites) is compiled for all proposed lease parcels identified from Expressions of Interest (EOIs). In addition, tribal consultation efforts are initiated to identify any areas or traditional cultural properties in close proximity to the proposed lease parcels that may be of particular concern to tribes. This information is then compiled into an Environmental Assessment and a decision is made to lease the parcel or defer leasing on the parcel.

In all cases, the standard lease notice and the following stipulation identified in IM-2005-003 will be attached to the leases (see Appendix A: Stipulation 16-1):

This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

Once a parcel has been leased, a Class III cultural resources inventory is required prior to any ground disturbing activities. Any cultural properties identified within the Area of Potential Effect (APE) are evaluated for significance and eligibility to the National Register of Historic Places. In a majority of cases, potential impacts to cultural resources are avoided through project abandonment or redesign. In rare instances, potential impacts are mitigated through other means in consultation with the North Dakota State Historic Preservation Office, the Advisory Council on Historic Preservation, and tribes that have expressed interest or concern. Specific “Guidance for Cultural Resource

Investigations on Oil and Gas Projects has been outlined in Instruction Memo MT-2006-040.

3.9 Native American Religious Concerns

BLM's management of Native American Religious concerns is guided through its 8120 Manual: *Tribal Consultation Under Cultural Resources Authorities* and 8120 Handbook: *Guidelines for Conducting Tribal Consultation*. Further guidance for consideration of fluid minerals leasing is contained in BLM Washington Office Instruction Memorandum 2005-003: Cultural Resources, Tribal Consultation, and Fluid Mineral Leasing. The 2005 memo notes leasing is considered an undertaking as defined in the National Historic Preservation Act. Generally areas of concern to Native Americans are referred to as "Traditional Cultural Properties" (TCPs) which are defined as cultural properties eligible for the National Register because of its association with cultural practices or beliefs that (a) are rooted in that community's history and (b) are important in maintaining the continuing cultural identity of the community.

Based on a settlement agreement between the BLM and the Mandan, Hidatsa, and Arikara Nation (MHAN), additional guidance for lease parcel reviews is provided in BLM Instruction Memorandum MT-2009-14: The agreement provides that upon receipt of lease nominations inside the exterior boundary of the Fort Berthold Indian Reservation, the NDFO will notify by letter the MHAN Tribal Chairperson and Tribal Historic Preservation Officer. The locations of lease parcels that are being reviewed must be presented so MHAN representatives can offer information on TCPs or other sensitive areas or concerns.

Summary reports that included the site and survey information for each lease parcel were sent to tribal historic preservation officers and tribal chairmen from the Turtle Mountain Band of the Chippewa Tribe (TMBC); the Standing Rock Sioux Tribe (SRST); the Three Affiliated Tribes, Mandan, Hidatsa, and Arikara Nation (MHAN); the Spirit Lake Tribe of Fort Totten, ND; the Northern Cheyenne Tribe, of Lane Deer MT; and the Fort Peck Sioux and Assiniboine Tribes of Poplar, MT (July 13, 2011).

At this time, no information has been offered as a result of this report and correspondence. Results of previous correspondence include: Mr. Kade Ferris, TMBC, Tribal Historic Preservation Officer made a statement of general concern for avoidance of stone circle features and other sensitive rock alignments during all BLM project management and standard operating procedures (telephone conversation 3/23/2010).

3.10 Paleontology

According to Section 6301 of the Paleontological Resource Protection Act of 2009 Omnibus Public Lands Bill, Subtitle D, SEC. 6301, defines paleontological resources as

“any fossilized remains, traces, or imprints of organisms, preserved in or on the earth’s crust, that are of paleontological interest and that provide information about the history of life on earth” All vertebrate fossils, be they fossilized remains, traces, or imprints of vertebrate organisms, are considered significant.

The geologic formations containing paleontological resources in the western part North Dakota extend into several of the neighboring states and Canada, with only minor sedimentary or depositional differences. The formations encompass the last of the dinosaurs in the Cretaceous Period to the rapid development of early mammals in the Paleocene and Eocene Epochs of the Tertiary Period. These formations are found in eastern Montana, northeastern Wyoming, northwestern Nebraska, western South Dakota and North Dakota, and southernmost Saskatchewan and Manitoba.

The late Cretaceous/early Tertiary formations in the northern Great Plains region are world renowned for their dinosaur and early mammal fossils. Most of the major museums in the United States have fossils from this region. Historically, most of the research and collecting occurred in Montana and Wyoming; however, recent finds have shown that similar fossils are preserved in equivalent formations in North and South Dakota. The Eocene/Oligocene/Miocene formations have also produced a huge number of significant mammal fossils over the last 130 years.

Most paleontologic localities recorded with BLM offices resulted from researchers performing field work. A few localities have been found during BLM-required mitigation of surface-disturbing activities. Some localities are simply local knowledge and the investigation of illegal collecting activities has revealed the location of some fossils.

Areas in North Dakota were grouped together where the exposed or underlying bedrock had the potential to produce significant numbers of the material of interest. Values were assigned based on potential fossil yield of vertebrates or other scientifically significant fossils in bedrock formations known for North Dakota. These values are as follows:

- (1) **Very Low** – Class 1: Igneous and metamorphic geologic units-not likely to contain recognizable fossils.
- (2) **Low** – Class 2: Sedimentary geologic units- not likely to contain vertebrate fossils or scientifically significant non-vertebrate fossils.
- (3) **Moderate or Unknown** –Class 3: Fossiliferous sedimentary geologic units – content varies in significance, abundance, and predictable occurrence. Some units of unknown potential.

- (4) **High** –Class 4: Geologic units containing a high occurrence of significant fossils. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. Surface disturbing activities may adversely affect paleontological resources in many cases.
- (5) **Very High** –Class 5: Highly fossiliferous geologic units- regularly produce vertebrate fossils or scientifically significant vertebrate fossils. Situated to be subject to human or natural degradation.

A review of Potential Fossil Yield Category (PFYC) formations indicates 11 lease parcels are located within PFYC formations rated Class 4 or 5 (NDM 97300- IC, IX, IZ, I8, I0, JR, JT, JV, JW, KN, and KM). The parcels were identified within three of the five geologic formations that are considered significant PFYC formations to the field office, the Bullion Creek, Brule, and Chadron. These formations are not considered as prospective as the Hell Creek and Ludlow formations, in which previous research projects on BLM land and paleontological surveys in southwestern North Dakota have located significant fossil remains.

3.11 Lands and Realty

The lands proposed for competitive leasing of the federal mineral estate are a mix of BLM administered lands (federal surface and minerals), other federal agencies, and private lands overlying federal minerals, and located in western North Dakota within the NDFO planning area to include the counties of Bowman, Golden Valley, McKenzie, Mountrail, Williams, Renville, Divide, Burke, Dunn, Bottineau, Slope, and Stark. Of the 35 parcels nominated for leasing, 5 parcels are located, in whole or in part, on BLM surface containing approximately 560.91 surface acres.

Parcel NDM 97300-I1: T. 153 N., R. 103 W., Sec. 27, NESW, (40 acres), PD, 5th PM, Williams County, North Dakota. No ROW located on this parcel. An application for mineral material disposal within this parcel was recently received by the NDFO.

Parcel NDM 97300-IZ: T. 153 N., R. 103 W., Sec. 26, SWNW, NESW, (80 acres), PD, 5th PM, Williams County, North Dakota. No ROW located on this parcel.

Parcel NDM 97300-KL: T. 152 N., R. 102 W., Sec. 21, Lot 5, (1.01 acres), 5th PM, McKenzie County, North Dakota. No ROW located on this parcel.

Parcel NDM 97300-EH: T. 132 N., R. 107 W., Sec. 26, NENE, SW, S2SE, (646.24 acres), 5th PM, Bowman County, North Dakota. ROW NDM 066109 (NENE) issued to Consolidated Telephone for buried communication cable and NDM 097267 (SW) issued

to Slope Electric Cooperative for an overhead power line. Sec. 34, Lots 1, 2, 3, 4, and E2E2 are split estate and acres are included in the total listed above.

Parcel NDM 97300-EK: T. 131 N., R. 107 W., Sec. 2, Lots 3, 4, S2NW (BLM), S2 (split estate), (479.90 acres), 5th PM, Bowman County, North Dakota. No ROW located on this parcel.

Four of the nominated lease parcels, approximately 430 acres, are either U.S. Fish and Wildlife Service (FWS) property or have a wetland or grassland easements encumbering the surface. Wetland easements restrict draining, burning, filling, or leveling of wetlands and the grassland easement protects the native grasslands from being disturbed. The easements are perpetual. Only one nominated parcel is encumbered by an easement: NDM 97300-JW. The following nominated parcels are FWS Property: NDM 79010-AS, NDM 79010-AN, and NDM 97300-GS.

Renewable energy includes biomass, geothermal, solar power, and wind. As demand has increased for clean and viable energy, the opportunity for renewable energy sources available on BLM public lands is considered as part of our multiple use objectives. Developing renewable energy projects depends on market trends and market value. The primary limiting factors in site selection include access to power transmission interconnects, acquisition of permits, and power purchase agreements between the producer and owner of the power lines.

Currently, there is no biomass, geothermal, solar power, or wind projects within the study area of the aforementioned parcels.

3.12 Minerals

3.12.1 Fluid Minerals

It is the policy of the BLM to make mineral resources available for disposal and to encourage development of these resources to meet national, regional, and local needs, consistent with national objectives of an adequate supply of minerals at reasonable prices. At the same time, the BLM strives to assure that mineral development occurs in a manner which minimizes environmental damage and provides for the reclamation of the lands affected.

Federal Oil and Gas Lease Information and Federal, State and Private Oil and Gas Development Activity within the External Boundaries of the NDFO

The USFS manages large areas of land within the boundaries of the NDFO that contain federal oil and gas lease acreage. Currently, there are 1,883 federal oil and gas leases covering approximately 1,008,015 acres in the State of North Dakota. Existing production activity holds approximately 43 percent of this lease acreage. Approximately

81 percent of this federal oil and gas lease acreage is within the boundaries of the USFS Dakota Prairie National Grasslands.

Information regarding the numbers and status of wells on federal, private/State, and Indian lands within the external boundary of the NDFO is displayed in Table 3.12.1.

If a lease parcel receives interest and oil and gas lease sales lead to lease issuance, exploration or development activity could occur during the term of the lease. Exploration and development proposals in the future would require a separate environmental document to consider specific proposals and address site-specific resource concerns.

	FEDERAL WELLS	PRIVATE AND STATE WELLS	INDIAN
Drilling Well(s)	100	698	106
Producing Gas Well(s)	114	88	0
Producing Oil Well(s)	756	4,836	136
Water Injection Well(s)	198	735	0
Shut-in Well(s)	28	64	5
Temporarily Abandoned Well(s)	60	314	3

Table 3.12.1. Existing Development Activity

3.12.2 Solid Minerals

Coal

There is no current coal production in the lease parcel areas. Information was verified utilizing the economic coal deposits GIS layer. No proposed lease parcels are lying over any leased coal deposits.

Locatable Minerals

Locatable minerals are minerals or materials subject to disposal and development through the Mining Law of 1872 (as amended). These generally include metallic minerals such as gold and silver and other materials not subject to lease or sale. There is currently no locatable mineral production or potential for production in the lease parcel areas.

Salable Minerals

Salable minerals are common varieties of mineral materials such as sand, gravel, and stone, as well as petrified wood. Common mineral materials may be sold or disposed of through free use permits under the provision of the Materials Act of July 31, 1947, amended July 23, 1955, and September 25, 1962. Salable minerals will be dealt with at the application for permit to drill (APD) stage.

NDFO has received application for a Mineral Material Sale (rock mining) in one parcel nominated for lease parcel. Parcel NDM 97300-I1 has the potential for Salable Mineral development.

3.13 Visual Resources

BLM Visual Resource classifications are only applied to BLM surface, as such, the affected environment for visual resources only consists of approximately 560 acres of BLM -administered surface in the analysis area. The NDFO does not currently have Visual Resource Classifications established for any lands found within the analysis area.

3.14 Recreation and Travel Management

BLM only manages recreational opportunities and experiences on BLM-administered surface. The affected environment consists of approximately 560 acres of BLM-administered public lands (surface). Recreational activities enjoyed by the public on BLM lands within the analysis area include hunting, hiking, camping, fishing, photography, off-road vehicle activities, picnicking, and winter activities such as snowmobiling. Benefits and experiences enjoyed by recreational users include opportunities for solitude, spending time with families, enhancing leisure time, improving sports skills, enjoying nature and enjoying physical exercise.

3.15 Livestock Grazing

Two of the lease parcels are located within three BLM grazing allotments. Table 3.15.1 identifies allotment specific information for each of the lease parcels. All three allotments are operated by ranches using the allotments for cow-calf and yearling operations. Most allotments have several range improvements such as fences, stock ponds, pipelines, springs, windmills, seedings, wells, and access roads for livestock management purposes.

Allotment Number	Allotment Name	Parcel ID	Allotment Category*	Livestock Type	Season of Use	# of Lessees	County	Surface Ownership
20614	Antelope Butte	NDM97300-EK NDM97300-EH	M	Cattle	03/01 - 02/28	1	Bowman	BLM and Private Surface
10595	Brushy Draw	NDM97300-EK	C	Cattle	03/01 - 02/28	1	Bowman	Private surface with unfenced BLM in

								allotment.
20659	Tatanka	NDM97300-EH	C	Cattle	05/15 - 11/20	1	Bowman	BLM

Table 3.15.1 – Lease parcels within grazing allotments

3.16 Economic Conditions

Introduction

Certain existing demographic and economic features influence and define the nature of local economic and social activity. Among these features are the local population, the presence and proximity of cities or regional business centers, longstanding industries, infrastructure, predominant land and water features, and unique area amenities. The affected local economy is made up of 12 counties in North Dakota (Bottineau, Bowman, Burke, Divide, Dunn, Golden Valley, McKenzie, Mountrail, Renville, Slope, Stark, and Williams) for which the BLM makes leasing decisions and has received oil and gas lease nominations since the last lease sale. Billings and Mercer counties are included because BLM manages other oil and gas leases and production in these counties. Ward County is also included in the affected local economy because of the oil and gas service companies that are based in Minot and the economic activity that flows through Ward County. The distribution of these economic effects is based on acres leased and levels of production as well as business patterns.

As of June 20, 2011, BLM showed existing federal mineral leases covering 207,656 acres for oil and gas exploration and development.

Affected Environment

The 15-county local economy had an estimated 2009 population of about 142,600 people. Total employment was estimated to be 107,700 jobs; there were an estimated 63,000 households; there were 201 NAICS industrial sectors represented in the local economy; average income per household was \$96,928; and total personal income was \$6,111 million (IMPLAN, 2009). The local economy includes less than one fourth of the ND population and many of the larger business centers in Western North Dakota. Within this local economy, there were 1.32 people per job and 0.59 households per job.

Nature of the Oil and Gas Industry in North Dakota:

According to the Independent Petroleum Association of America (IPAA, 2011), a total of 717 wells were drilled in North Dakota in 2008. Of these, 682 were oil wells, 4 were gas wells, and 31 were reported as dry holes. North Dakota produced 58,384,000 bbls of oil and 21,099 MMCF of natural gas. North Dakota had 153 active operators in 2008.

Leasing and production of federal oil and gas minerals in North Dakota is a major economic activity. Between FY2005 and FY2010, annual oil and gas production from federal minerals averaged 7.37 million barrels of oil and 9,035,832 mcf of processed and unprocessed natural gas (ONRR, 2011). Oil and gas bonus bids paid on federal leases amounted to \$318.0 million between FY2003 and FY2011. This was an average of \$516.79 per acre. Federal lease rents averaged \$35.8 million per year between FY2005 and FY2010 (ONRR, 2011). In 2010, disbursements of oil and gas royalty revenues to the state and counties were \$16.385 million and disbursements to the state and counties from rents and bonuses amounted to \$21,233 million (Office of Natural Resource Revenues, 2011).

Local economic effects of leasing federal minerals for oil and gas exploration, development, and production are influenced by the number of acres leased, number of wells drilled, and estimated levels of production. These activities influence local employment, income, and public revenues (indicators of economic impacts).

Leasing:

The remainder of this analysis will focus on federal minerals for which BLM makes leasing decisions.

As of June 20, 2011, a total of 207,656 acres of the federal minerals were under lease by the BLM in North Dakota. Annual lease rental is paid on 87,570 acres that are not held by production. Estimated total annual average BLM lease bonus and rental revenue to the federal government is about \$35.5 million. As of July 14, 2011, lease rents were not paid on 120,086 acres that were held by production. Instead, royalties are paid on oil and gas production from these leases.

Federal oil and gas leases generate a one-time lease bid as well as annual rents. The minimum lease bid is \$2.00 per acre; however, between FY2003 and FY2011, bonus bids in North Dakota averaged \$516.79 for every acre of federal oil and gas minerals that was leased in the state. In addition, lease rental is \$1.50 per acre per year for the first five years and \$2.00 per acre per year thereafter. Typically, oil and gas leases expire after 10 years unless held by production. Annual lease rentals continue until one or more wells

are drilled that result in production and associated royalties. Within the ND Field Office, about 58 percent of the BLM leased acres are held by production.

Mineral revenues distribution to the state and counties from lease bonus bids, rents, and royalties depends on the whether the minerals are public domain minerals or minerals acquired by the federal government. How acquired mineral revenues are distributed to the state and counties is further influenced by the authority under which the minerals were acquired and what federal agency manages surface resources.

Currently, 54 percent of the BLM managed minerals are classified as public domain minerals and 49 percent of the federal leasing revenues from these minerals are distributed to the state. For revenues received from public domain lands, the state of North Dakota distributes 50 percent of these revenues among the counties in which the minerals were produced. The other 50 percent of funds that North Dakota receives is distributed to school districts (ND state code 15.1-27-25).

About 46 percent of minerals managed by the BLM are acquired minerals. A weighted average of 19 percent of federal revenue from the acquired mineral estate in North Dakota is distributed directly to the counties with leases and production.

In FY2010, the federal government collected \$46.8 million in lease bonus bids and rent from BLM managed leases; of which \$21.2 million was distributed to the state/local governments.

Production:

In 2010, production from BLM federal minerals in ND Field equaled an estimated 1.757 million barrels of oil and 1,719,896 MCF of natural gas (Office of Natural Resource Revenue, 2011). Oil and gas leasing and production influences fiscal conditions of local governments and school districts through contributions to oil/gas production taxes, and distribution of federal mineral royalty payments on production from public mineral estate. Local oil and gas exploration, development, and production as well as oil and gas transmission all support jobs and income in the local economy.

Federal oil and gas production in North Dakota is subject to production taxes or royalties. The federal oil and gas royalty revenues equal 12.5 percent of the value of production (43 CFR 3103.3.1). Currently, 49 percent of the federal royalty revenues from public domain minerals are distributed to the state. In North Dakota, 50 percent of the royalty revenues that the state receives from mineral production are redistributed to the counties of production (North Dakota Code 15.1-27-25).

Federal royalties on production from BLM managed acquired federal minerals are distributed differently. The share that is available to states and counties is determined by the authority under which the lands are acquired. In North Dakota, a weighted average of 31 percent of federal lease bonus, rent, and royalty revenues are distributed to the state and 19% is distributed to counties.

Estimated annual average BLM federal oil and gas mineral production royalty revenues are \$18.1 million. About \$7.4 million of the annual average production royalties were distributed to the state and \$4.0 million are distributed to county governments. The contributions of BLM federal mineral production to local economies vary among the counties. The counties that received the largest federal payments were Dunn, Bowman, McKenzie, and Billings.

Local Economic Contribution:

The economic contribution to a local economy is measured by estimating the employment and labor income generated by 1) payments to counties associated with the leasing, rent, and production of federal minerals, 2) local royalty payments associated with production of federal oil and gas, and 3) economic activity generated from drilling and associated activities. Activities related to oil and gas leasing, exploration, development, and production form a basic industry that brings money into the state and region and creates jobs in other sectors. The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. Within the 15-county economy, extraction of all (federal and non-federal) oil and natural gas (NAICS sector 20), drilling oil and gas wells (NAICS sector 28), and support activities for oil and gas operations (NAICS sector 29) supported an estimated 6,249 total jobs and \$462.2 million in total employee compensation and proprietor's income in the local economy (IMPLAN, 2009).

There are approximately 210,000 acres of federal minerals currently leased by the BLM. About 88,000 acres are held by production and annual rent is collected on the remaining 68,000 acres. Bonus bids on federal minerals average \$516.79 per acre. Estimated average annual total federal revenues from BLM managed federal oil and gas leasing, rents, and royalty payments are \$53.6 million. Annual average federal revenues distributed to the state of North Dakota are an estimated \$21.8 million per year. An estimated annual average \$16.5 million is distributed to the counties of production. About half of these revenues help fund traditional county functions such as maintaining roads and highways, enforcing laws, administering justice, collecting and disbursing tax

funds, providing for orderly elections, providing fire protection, and keeping records. The rest of the revenues are used to fund primary and secondary education.

The estimated annual local economic contribution associated with federal leases, rents, drilling, production, and royalty payments combined to support about 2,450 total local jobs and \$143.2 million in local labor income, respectively (IMPLAN, 2009). This amounts to about two percent of the local employment and almost three percent of local income. Table 3.16.1 shows the current contributions of leasing federal oil and gas minerals and the associated exploration, development, and production of federal oil and gas minerals to the aggregated industrial sectors of the local economy.

Industry	Employment (jobs)		Labor Income (Thousands of 2009 dollars)	
	Area Totals	Federal BLM-managed O&G -Related	Area Totals	Federal BLM-managed O&G-Related
Agriculture	9,567	2	\$401,453	\$153
Mining	7,158	855	\$542,388	\$71,640
Utilities	1,531	15	\$168,519	\$1,633
Construction	7,754	19	\$385,105	\$939
Manufacturing	2,648	8	\$137,579	\$390
Wholesale Trade	4,226	224	\$267,090	\$14,172
Transportation & Warehousing	3,648	146	\$259,150	\$10,273
Retail Trade	10,806	147	\$288,522	\$3,708
Information	1,385	33	\$72,844	\$1,762
Finance & Insurance	4,848	141	\$155,089	\$4,364
Real Estate & Rental & Leasing	1,991	71	\$76,683	\$4,329
Prof, Scientific, & Tech Services	3,041	194	\$147,388	\$10,283

Mngt of Companies	192	24	\$13,626	\$1,728
Admin, Waste Mngt & Rem Serv	3,615	70	\$86,745	\$1,598
Educational Services	722	11	\$9,101	\$143
Health Care & Social Assistance	10,332	120	\$425,748	\$5,109
Arts, Entertainment, and Rec	1,420	19	\$22,433	\$277
Accommodation & Food Services	6,987	100	\$111,925	\$1,547
Other Services	5,318	100	\$148,364	\$2,782
Government	20,467	149	\$1,151,449	\$6,329
Total	107,656	2,449	4,871,199	143,162
Federal BLM-managed O&G as Percent of Total		2.28%		2.94%

Source: IMPLAN, 2009

3.16.1. Current Contributions of Federal Oil and Gas Leasing, Exploration, Development, and Production to the Local Economy

3.17 Social and Environmental Justice:

Demographic Information for Counties with Acreage in the Oil and Gas Lease Sale

County	Population 2010	% Population Change 2000-2010	Population Per Square Mile	% American Indian 2010	% Population Below the Poverty Level 2009	Lease Acreage (Acres)
Bottineau	6,429	-10.1	3.9	2.1	11.1	160
Bowman	3,151	-3.8	2.7	0.6	7.7	1,406
Burke	1,968	-12.2	1.8	0.8	9.6	160

Divide	2,071	-9.3	1.6	0.5	11.6	1,237
Dunn	3,536	-1.8	1.8	12.7	11.2	226
Golden Valley	1,680	-12.7	1.7	0.6	13.3	642
McKenzie	6,360	10.9	2.3	22.2	12.8	177
Montrail	7,673	15.7	4.2	30.6	12.4	110
Renville	2,470	-5.4	2.8	0.4	8.1	640
Slope	727	-5.2	0.6	2.2	13.1	1,094
Stark	24,199	6.9	18.1	1.0	9.6	543
Williams	22,398	13.3	10.8	4.0	8.6	919
Study Area	82,662	5.2	4.4	6.7	10.8	7,314
North Dakota	672,591	4.7	9.8	5.4	11.7	7,314

Source: <http://quickfacts.census.gov.qfd/state> August 8, 2011

This section focuses on western North Dakota where the lease acreage being examined is located. The 3 counties with the largest amount of acreage are Bowman, Divide and Slope. Each of these counties has more than 1,000 acres under consideration while Bottineau, Burke, Dunn, McKenzie and Mountrail all have less than 500 acres under consideration. The total population in these counties in 2010 was 82,662. This figure represented an increase of 5.2 percent since 2000. The 2010 county populations ranged from less than 2,500 in Burke, Divide, Golden Valley, Renville and Slope counties to more than 20,000 in Stark and Williams counties. The larger communities in these counties which provide oil and gas industry support include Dickinson (population 17,737) in Stark County and Williston (population 14,716) in Williams County. In addition, there are many smaller incorporated and unincorporated communities in the vicinity of the leases.

The population density (persons per square miles) for the twelve counties in 2010 ranged from 1.6 in Divide County to 18.1 in Williams County compared to a statewide figure of 9.8. The areas in the vicinity of the leases are home to farms and ranches. Oil and gas exploration and production is already occurring in the vicinity of most of these leases. Approximately 80% of the acreage being considered is split-estate where BLM does not manage the surface acres.

IN 2010, the percent American Indian ranged from that in 1% in Bowman, Burke, Divide, Golden Valley and Renville Counties to more than 20% in McKenzie and Mountrail Counties. The percent of the population living below the poverty level in 2009 ranged from less than 8% in Bowman County to more than more than 13% in Golden Valley and Slope Counties. These figures compare to a statewide figure of 11.7%. Some of the leases are near the Fort Berthold Indian Reservation, which is located in McLean, Mountrail, Dunn, McKenzie, Mercer and Ward counties.

The social environment of these counties is described in detail in the North Dakota Resource Plan Analysis of the Management Situation (2009).

4.0 ENVIRONMENTAL IMPACTS

4.1 Assumptions and Reasonably Foreseeable Development Scenario (RFD) Summary

At this stage of the leasing process, the act of leasing parcels would not result in any activity that might affect various resources. Even if parcels are leased, it remains unknown whether development would actually occur, and if so, where specific facilities would be placed. This would not be determined until the BLM receives an APD in which more detailed information about proposed activities and facilities would be clarified for particular lease parcels. Therefore, this EA discusses potential effects that could occur in the event of development.

Upon receipt of an APD, the BLM would initiate a more site-specific NEPA analysis to more fully analyze and disclose site-specific effects of specifically identified activities. In all potential exploration and development scenarios, the BLM would require the use of best management practices (BMPs) documented in “Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development,” also known as the “Gold Book” (USDI and USDA 2007). The BLM could also identify APD Conditions of Approval, based on site-specific analysis, that could include moving the well location, restrict timing of the project, or require other reasonable measures to minimize adverse impacts (43 CFR 3101.1-2 Surface use rights; Lease Form 3100-11, Section 6) to protect sensitive resources, and to ensure compliance with laws, regulations, and land use plans.

Environmental consequences are discussed below by alternative, with information described in Chapter 3, serving as the baseline for impact analysis. As per NEPA regulations at 40 CFR 1502.14(f), 40 CFR 1502.16(h), and 40 CFR 1508.20, mitigation measures to reduce, avoid, or minimize potential impacts of the proposed action are identified by resource below.

The following assumptions are from the RFD developed for the NDFO RMP revision (http://www.blm.gov/mt/st/en/fo/north_dakota_field/rmp/RFD.html.) The BLM administers approximately 324,269 acres of federal minerals (for fluid minerals) within the NDFO. The RFD forecasts and maps the oil and gas development potential in the North Dakota planning area.

A version of this map is reproduced with this EA as **Map 4.1.1**. For the RFD , very high potential forecasts more than 20 well pads ; high potential forecasts 10 to 20 well pads; moderate potential forecasts two to 10 well pads; low potential forecasts one to two

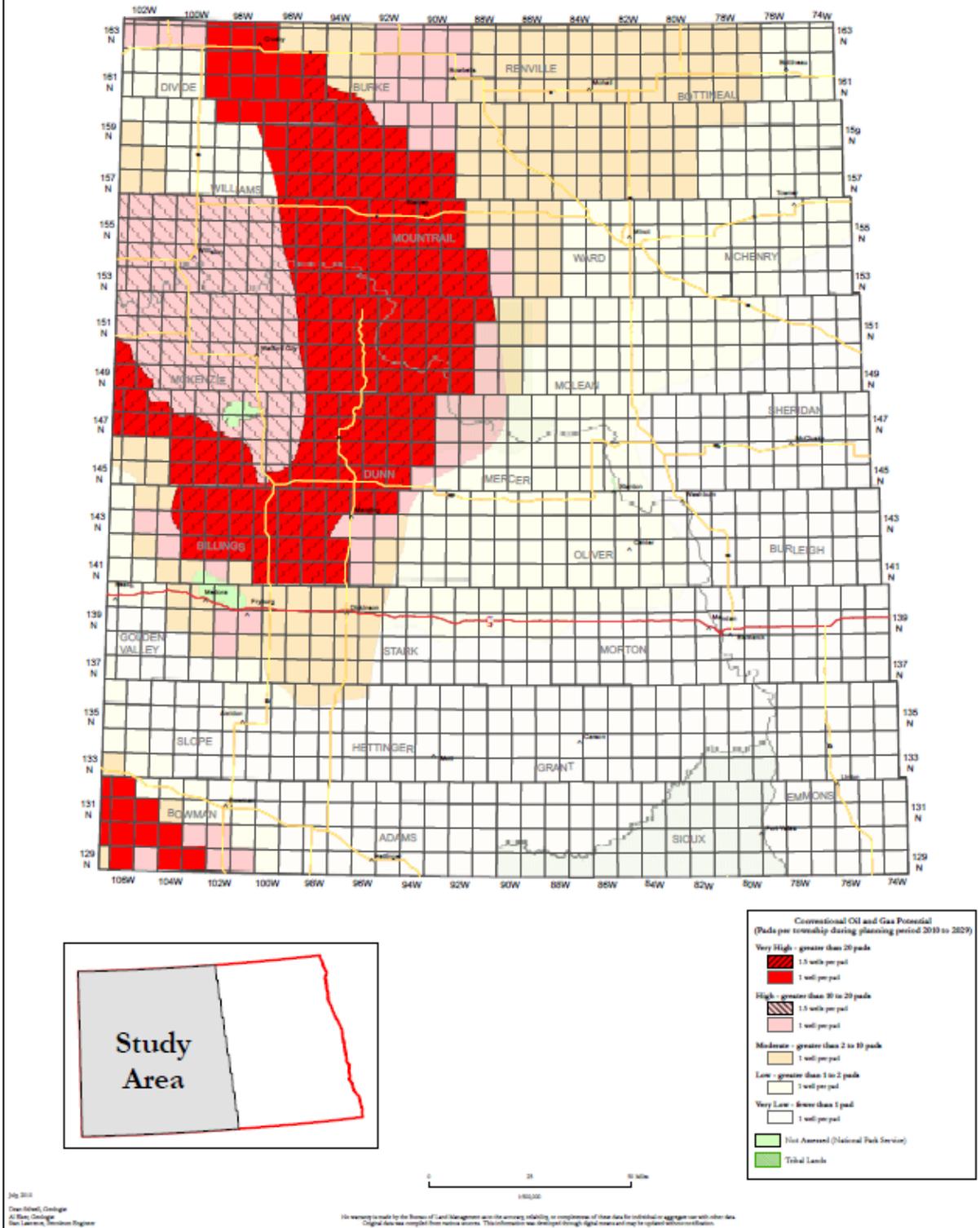
well pads; and very low potential forecasts less than one well per township over the life of the plan.

A hypothetical coalbed natural gas (CBNG) play is assumed in the planning area in the Williston Basin. Pilot projects would contain 16 to 25 wells. A total of 150 wells are forecasted allowing for some exploration activity and preliminary development.

Directional and horizontal drilling has, in the past several years, become important in the planning area. Drilling depths (measured depth) are from 4,413 to 21,727 feet for oil wells and 4,173 to 19,954 feet for gas wells. However, most of the oil wells have a measured depth of between 13,000 and 16,000 feet, and the measured depths of gas wells are typically within the 13,000 to 16,000 foot range.

The majority of the oil and gas wells in the planning area have historically been drilled vertically. However, of the 2,983 wells spud in the planning area between January 1998 and December 2007, only 787 were vertical wells. Vertical well depths in North Dakota range from a few hundred feet in the northeast part of the study area to over 15,000 feet in the central Williston Basin. Disturbance projections from the RFD are presented in Tables 4.1.1 and 4.1.2. Measured depths in the southwest part of the state range from 1,300 feet to 9,500 feet.

Oil and gas (excluding coalbed gas) development potential and projected pad densities and associated wells within the North Dakota Study Area for 2010 through 2029



Map 4.1.1. RFD Scenario for Development Potential

Well Pads			Acres of Surface Disturbance			
Type	Total	BLM Managed	Access Roads	Well Pad	Total	BLM Managed
New Exploratory and Development Coalbed Gas Well Pads (2010-2029)	150	7	0.6	0.5	165	8
New Exploratory and Development Gas Well Pads (2010-2029)	315	34	0.6	0.5	347	40
New Exploratory and Development Oil Well Pads; 1.5 wells/pad (2010-2029)	3,691	402	2.9	4.2	26,206	2,945
New Exploratory and Development Oil Well Pads 1.0 wells/pad (2010-2029)	2,609	284	2.9	4	18,002	2,023
<i>Total New Exploratory and Development Well Pads</i>	<i>6,765</i>	<i>727</i>			<i>44,720</i>	<i>5,017</i>
Existing Active Gas Well Pads (as of August 2010)	211	121	0.3	0.25	116	71
Existing Active Oil Well Pads (as of August 2010)	6,760	851	1.5	1.75	21,970	2,857
<i>Total Existing and Projected Well Pads</i>	<i>6,971</i>	<i>972</i>			<i>22,086</i>	<i>2,928</i>
Total Well Pads	13,736	1,699	Total Short-Term Disturbance		66,806	7,945

Table 4.1.1. Disturbance Associated With Existing Well Pads and Projected Active Well Pads for the Baseline Scenario (Short-Term Disturbance)

Well Pads			Acres of Surface Disturbance			
Type	Total	BLM Managed	Access Roads	Well Pad	Total	BLM Managed
New Producing Coalbed Gas Well Pads (2010-2029)	135	6	0.3	0.25	74	4
New Producing Gas Well Pads (2010-2029)	293	21	0.3	0.25	161	12
New Producing Oil Well Pads; 1.5 wells/pad (2010-2029)	3,248	353	1.5	1.75	10,556	1,186
New Producing Oil Well Pads; 1.0 wells/pad (2010-2029)	2,035	221	1.5	1.75	6,614	743
<i>Total New Producing Well Pads</i>	<i>5,711</i>	<i>602</i>			<i>17,405</i>	<i>1,945</i>
Existing Active Gas Well Pads (as of August 2010) ¹	203	116	0.3	0.25	111	68
Existing Active Oil Well Pads (as of August 2010) ¹	5,881	740	1.5	1.75	19,114	2,486
<i>Total Existing and Projected Well Pads</i>	<i>6,084</i>	<i>857</i>			<i>19,225</i>	<i>2,554</i>
Total Well Pads	11,795	1458	Total Long-Term Disturbance		36,631	4,499
¹ minus abandonments during August 2010-December 2029 period						

Table 4.1.2. Disturbance Associated With Existing Well Pads and Projected Producing Well Pads for the Baseline Scenario (Long-Term Disturbance)

New oil and gas wells projected to be drilled in the NDFO RFD from 2010 through 2029 total as many as 8,460 in the planning area. Up to 150 of these wells could be coalbed gas wells. Of the other remaining wells (those drilled in areas of very high, high or

moderate potential areas) the majority are projected to be drilled in and around existing fields in the deeper portion of the Williston Basin and along the Cedar Creek anticline. Those wells drilled in areas of low or very low potential are projected for areas generally not proven productive by historical drilling, but which still may contain hydrocarbons based on U.S. Geological Survey assessment data. The BLM component of oil and conventional gas activity within the RFD is expected to be approximately 11.4 percent of all activity.

The context of alternatives considered in this EA relative to these assumptions is described below.

Alternative A Assumptions (No Action Alternative)

Under the No Action Alternative, the proposed parcels would not be leased. There would be no new impacts from oil and gas production on the parcel lands. No additional natural gas or crude oil would enter the public markets, and no royalties would accrue to the federal or state treasuries. The No Action Alternative would result in the continuation of the current land and resource uses on the parcels.

Unless specifically indicated by resource, no further analysis of the No Action Alternative is presented in the following sections.

Alternative B Assumptions

By itself, the act of leasing the parcels would have no impact on any natural resources in the area administered by the NDFO. Standard terms and conditions as well as special stipulations would apply to the lease parcels.

If the lease parcels are developed, short-term impacts would be stabilized or mitigated rapidly (within two to five years). Long-term impacts are those that would substantially remain for more than five years. The 35 parcels are located within 12 counties: Bottineau, Bowman, Burke, Divide, Dunn, Golden Valley, McKenzie, Mountrail, Renville, Slope, Stark, and Williams.

All parcels are within that portion of the NDFO where a hypothetical CBNG play could occur according to the RFD projection. The RFD assumes a total projection of 150 CBNG wells for the entire planning area, primarily for exploration purposes.

Eight parcels (approximately 2,061 acres) are located in an area of very high potential. Projected development within the very high potential area is greater than 20 well pads per year.

Seventeen parcels (approximately 2,699 acres) are located in an area of high potential. Projected development within the high potential area is 10 to 20 well pads per year.

Five parcels (approximately 1,637 acres) are located in an area of moderate potential. Projected development within the moderate potential area is 2 to 10 well pads per year.

Five parcels (approximately 917 acres) are located in an area of low potential. Projected development within the low potential area is 1 to 2 well pads per year.

Zero parcels are located in an area of very low potential. Projected development within the very low potential area is less than 1 well pad per year.

For the purposes of this EA and based on the location of these parcels in the Williston Basin, any future development activity that would occur would probably be oil production. Short-term disturbance would be 2.9 acres for access roads and flow lines and four acres per well pad. Long-term disturbance would be 1.5 acres for access roads and 1.75 acres per well pad. Many of the parcels would probably require the formation of a communitization agreement (CA) to facilitate development. Actual well drilling and surface disturbance activity may occur on fee or state lands, not on the federal lease parcels.

Alternative C Assumptions

By itself, the act of leasing the parcels would have no impact on any natural resources in the area administered by the NDFO. Standard terms and conditions as well as special stipulations would apply to the lease parcels.

If the lease parcels are developed, short-term impacts would be stabilized or mitigated rapidly (within two to five years). Long-term impacts are those that would substantially remain for more than five years. The 32 parcels are located within 11 counties: Bottineau, Burke, Divide, Dunn, Golden Valley, McKenzie, Mountrail, Renville, Slope, Stark, and Williams. Three parcels located in Bowman County are assumed to be deferred in these assumptions; therefore they are not included in the potential projected development breakdown below.

All parcels are within that portion of the NDFO where a hypothetical CBNG play could occur according to the RFD projection. The RFD assumes a total projection of 150 CBNG wells for the entire planning area, primarily for exploration purposes.

Five parcels (approximately 655 acres) are located in an area of very high potential. Projected development within the very high potential area is greater than 20 well pads per year.

Seventeen parcels (approximately 2,699 acres) are located in an area of high potential. Projected development within the high potential area is 10 to 20 well pads per year.

Five parcels (approximately 1,637 acres) are located in an area of moderate potential. Projected development within the moderate potential area is 2 to 10 well pads per year.

Five parcels (approximately 917 acres) are located in an area of low potential. Projected development within the low potential area is 1 to 2 well pads per year.

Zero parcels are located in an area of very low potential. Projected development within the very low potential area is less than 1 well pad per year.

For the purposes of this EA and based on the location of these parcels in the Williston Basin, any future development activity that would occur would probably be oil production. Short-term disturbance would be 2.9 acres for access roads and flow lines and four acres per well pad. Long-term disturbance would be 1.5 acres for access roads and 1.75 acres per well pad. Many of the parcels would probably require the formation of a communitization agreement (CA) to facilitate development. Actual well drilling and surface disturbance activity may occur on fee or state lands, not on the federal lease parcels.

4.2 Air Resources

4.2.1 Direct and Indirect Effects

Air Quality

Leasing the subject parcels would have no direct impacts on air quality. Any potential effects on air quality from activities on these lease parcels would occur if and when the leases were developed.

Potential impacts of development could include increased airborne soil particles blown from new well pads or roads; exhaust emissions from drilling equipment, compressors, vehicles, and dehydration and separation facilities; and potential releases of GHGs and volatile organic compounds during drilling or production activities. The amount of increased emissions cannot be precisely quantified at this time since it is not known for certain how many wells might be drilled, the types of equipment needed if a well were to be completed successfully (e.g., compressor, separator, dehydrator), or what technologies may be employed by a given company for drilling any new wells. The degree of impact would also vary according to the characteristics of the geologic formations from which production occurs and according to the scope of specific activities proposed in an APD.

Current monitoring data show that the criteria pollutants fall well below applicable air quality standards, indicating very good air quality. The potential level of development and mitigation (section 4.2.2.) is expected to maintain this level of air quality by limiting emissions. In addition to the limited level of development, pollutants would be regulated through the use of state-issued air quality permits or air quality registration processes developed to maintain air quality below applicable standards.

Greenhouse Gas (GHG) Emissions at the North Dakota FO and Project Scales

Sources of GHGs associated with development of lease parcels may include construction activities, operations, and facility maintenance in the course of oil and gas exploration, development, and production. Estimated GHG emissions are discussed for these specific aspects of oil and gas activity because the BLM has direct involvement in these steps. However, the current proposed activity is to offer parcels for lease. No specific development activities are currently proposed or potentially being decided upon for any parcels being considered in this EA. Potential development activities would be analyzed in a separate NEPA analysis effort if the BLM receives an APD for any of the parcels considered here.

Anticipated GHG emission estimates presented in this section are taken from the Climate Change SIR (2010). Data are derived from GHG emissions calculators developed by Air Resource Specialists at the BLM National Operations Center in Denver, CO, based on methods described in Climate Change SIR (2010). Based on the RFD assumptions summarized above for the NDFO, Table 4.2.1 discloses projected annual GHG source emissions from BLM-permitted activities associated with the RFD.

Source	BLM Long-Term GHG Emissions (tons/year)				Emissions (metric tons/yr)
	CO ₂	CH ₄	N ₂ O	CO ₂ e	CO ₂ e
Conventional Natural Gas	562.7	116.7	0.01	3,106.03	2,736.9
Coal Bed Natural Gas	3,822.02	49.22	0.07	4,876.9	4,425.5
Oil	547,165.01	1,132.1	7.44	573,246.9	520,187.7
Total	551,549.7	1,298.02	7.52	581,829.8	527,350

Table 4.2.1. BLM component of projected annual emissions of GHGs associated with oil and gas exploration and development activity in the NDFO.

Under Alternative A, there would be no GHG emissions that would result from this project because under this alternative no additional parcels would be leased.

To estimate potential GHG emissions associated with the action alternative for this project, the following approach was used:

1. The proportion of each project level action alternative relative to the total RFD was calculated based on total acreage of parcels under consideration for leasing (and/or lifting of lease suspensions) relative to the total acreage of federal mineral acreage available for leasing in the RFD.
2. This ratio was then used as a multiplier with the total estimated GHG emissions for the entire RFD (with highest year emission output) to estimate GHG emissions for that particular alternative.

Under both Alternative B and Alternative C, approximately 7,314 acres of federal minerals would be leased. These acres constitute 2.26 percent of the total federal mineral estate of 324,269 acres identified for the North Dakota RFD. Therefore, based on the approach described above to estimate GHG emissions, 2.26 percent of the total estimated BLM emissions of 527,350 metric tons/year would be approximately 11,894 metric tons/year of CO₂e if the parcels within Alternative B were to be developed.

Climate Change

The assessment of GHG emissions and climate change is in its formative phase. As summarized in the Climate Change SIR (2010), climate change impacts can be predicted with much more certainty over global or continental scales. Existing models have difficulty reliably simulating and attributing observed temperature and precipitation changes at small scales. On smaller scales, natural climate variability is relatively larger, making it harder to distinguish changes expected due to local forcings (such as contributions from local activities to GHGs). Uncertainties in local forcings and feedback also make it difficult to estimate the contribution of GHG increases to observed small-scale temperature changes (Climate Change SIR, 2010).

It is currently not possible to know with certainty the net impacts from developing lease parcels on climate. 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. It is therefore beyond the scope of existing science to relate a specific source of GHG emissions or sequestration with the creation or mitigation of any specific climate-related environmental effects. Although the effects of greenhouse gas emissions in the global aggregate are well-documented, it is currently impossible to determine what specific effect greenhouse gas emissions resulting from a particular activity might have on the environment (Additional information on environmental effects typically attributed to climate change is provided below).

As mentioned earlier, the act of leasing does not produce any GHG emissions in and of itself. Releases of GHGs would occur at the exploration/development stage.

4.2.2 Mitigation

The BLM encourages industry to incorporate and implement BMPs to reduce impacts to air quality by reducing emissions, surface disturbances, and dust from field production and operations. Measures may also be required as conditions of approval (COA) on permits by either the BLM or the applicable state air quality regulatory agency. The BLM also manages venting and flaring of gas from federal wells as described in the provisions of Notice to Lessees (NTL) 4A, Royalty or Compensation for Oil and Gas Lost.

Some of the following measures could be imposed at the development stage:

- flare or incinerate hydrocarbon gases;
- operate emission control equipment with minimum 95 percent volatile organic compound (VOC) control efficiency on petroleum storage tank batteries;
- operate low-emitting drill rig engines, such as Tier 4 diesel engines or natural gas or electric drill rig engines;
- operate gas or electric turbines for natural gas compression rather than internal combustion engines;
- replace older internal combustion engines with low-emitting engines that meet EPA New Source Performance Standards;
- apply water or chemical suppressants to dirt and gravel roads during periods of high use and control speed limits to reduce fugitive dust emissions;
- perform interim reclamation to re-vegetate areas of well pads not required for ongoing production facilities.
- construct multiwall pads using directional drilling and horizontal completion technologies to reduce surface disturbance and traffic;
- replace diesel-fired pump jack engines with electrified engines;
- reinject CO₂ and methane into no-producing wells or other underground formations;
- use forward looking infrared (FLIR) technology to detect fugitive VOC and methane emissions and repair leaking equipment quickly; and
- air monitoring for NO_x and ozone (O₃).

Additional GHG emission reduction technologies focusing on methane emission reductions from oil, natural gas, and coalbed natural gas activities, are provided in Section 6 of the Climate Change SIR (2010) Technologies discussed in Climate Change SIR (2010) and as summarized below in Table 4.2.2.1 (reproduced from Table 6-2 in Climate Change SIR (2010)) displays common methane emission technologies reported

under the EPA Natural Gas STAR Program and associated emission reduction, cost, maintenance and payback data.

Source Type / Technology	Annual Methane Emission Reduction ¹ (Mcf/yr)	Capital Cost Including Installation (\$)	Annual Operating and Maintenance Cost (\$)	Payback (Years or Months)	Payback Gas Price Basis (\$/Mcf)
Wells					
Reduced emission (green) completion	7,000 ²	\$1K – \$10K	>\$1,000	1 – 3 yr	\$3
Plunger lift systems	630	\$2.6K – \$10K	NR	2 – 14 mo	\$7
Gas well smart automation system	1,000	\$1.2K	\$0.1K – \$1K	1 – 3 yr	\$3
Gas well foaming	2,520	>\$10K	\$0.1K – \$1K	3 – 10 yr	NR
Tanks					
Vapor recovery units on crude oil tanks	4,900 – 96,000	\$35K – \$104K	\$7K – \$17K	3 – 19 mo	\$7
Consolidate crude oil production and water storage tanks	4,200	>\$10K	<\$0.1K	1 – 3 yr	NR
Glycol Dehydrators					
Flash tank separators	237 – 10,643	\$5K – \$9.8K	Negligible	4 – 51 mo	\$7
Reducing glycol circulation rate	394 – 39,420	Negligible	Negligible	Immediate	\$7
Zero-emission dehydrators	31,400	>\$10K	>\$1K	0 – 1 yr	NR
Pneumatic Devices and Controls					
Replace high-bleed devices with low-bleed devices					
End-of-life replacement	50 – 200	\$0.2K – \$0.3K	Negligible	3 – 8 mo	\$7
Early replacement	260	\$1.9K	Negligible	13 mo	\$7
Retrofit	230	\$0.7K	Negligible	6 mo	\$7
Maintenance	45 – 260	Negl. to \$0.5K	Negligible	0 – 4 mo	\$7
Convert to instrument air	20,000 (per facility)	\$60K	Negligible	6 mo	\$7
Convert to mechanical control systems	500	<\$1K	<\$0.1K	0 – 1 yr	NR

Source Type / Technology	Annual Methane Emission Reduction ¹ (Mcf/yr)	Capital Cost Including Installation (\$)	Annual Operating and Maintenance Cost (\$)	Payback (Years or Months)	Payback Gas Price Basis (\$/Mcf)
Valves					
Test and repair pressure safety valves	170	NR	\$0.1K – \$1K	3 – 10 yr	NR
Inspect and repair compressor station blowdown valves	2,000	<\$1K	\$0.1K – \$1K	0 – 1 yr	NR
Compressors					
Install electric compressors	40 – 16,000	>\$10K	>\$1K	>10 yr	NR
Replace centrifugal compressor wet seals with dry seals	45,120	\$324K	Negligible	10 mo	\$7
Flare Installation	2,000	>\$10K	>\$1K	None	NR

Table 4.2.2.1. Selected Methane Emission Reductions Reported Under the EPA Natural Gas STAR Program ¹

Source: Multiple USEPA Natural Gas STAR Program documents. Individual documents are referenced in Climate Change SIR (2010).

¹ Unless otherwise noted, emission reductions are given on a per-device basis (e.g., per well, per dehydrator, per valve, etc).

² Emission reduction is per completion, rather than per year.

K = 1,000

mo = months

Mcf = thousand cubic feet of methane

NR = not reported

yr = year

Future federally-mandated reductions in oil and gas emissions are expected to occur in 2012 and beyond. On July 28, 2011, EPA announced proposed new emission control regulations for the oil and gas industry. Proposed emission reduction requirements would primarily affect natural gas production facilities and would prompt large emission reductions of VOCs, sulfur dioxide, and methane. The new standards are expected to be finalized by February 28, 2012.

4.3 Soil Resources

At this stage (lease sale) there are no impacts to soil resources. Impacts (both direct and indirect) would occur if the lease is developed in the future. The potential impacts would be analyzed on a site-specific basis during the APD stage prior to development.

4.3.1 Direct and Indirect Effects

While the act of leasing a tract would produce no impacts, the development of the leases would result in reasonably foreseeable disturbances to soils. Construction and operation of well pads, access roads, pipelines, power lines, reserve pits, and other facilities would result in the exposure of mineral soil, soil compaction, loss of soil productivity, and increased susceptibility to wind and water erosion. The likelihood and magnitude of these occurrences is dependent upon local site characteristics, climatic events, and the specific mitigation applied. To protect slopes or fragile soils, surface disturbance would not be allowed on slopes of more than 30 percent (refer to Appendix A for a detailed description of stipulations that would be applied for the proposed action).

4.3.2 Mitigation

If exploration/development were to occur, a number of measures would be taken to prevent, minimize, or mitigate impacts to soil resources. The operator would stockpile the topsoil from the surface of well pads and then use it for surface reclamation. Once this topsoil is applied and vegetation is reestablished, the impacts would be remediated.

Reserve pits would be re-contoured and reseeded as described in the COAs attached to the APD. Upon abandonment of wells and/or when access roads are no longer in service, the authorized officer would issue instructions and/or orders for surface reclamation/restoration of the disturbed areas as described in the attached COAs.

Road constructions requirements and regular maintenance would alleviate potential impacts to access roads from water erosion damage. Lease stipulations regarding steep slopes and erosive soils would minimize potential impacts. To protect slopes or fragile soils, surface disturbance would not be allowed on slopes of more than 30 percent.

Additional mitigation measures and/or BMPs would be assigned once a site-specific plan of development is proposed.

4.4 Water Resources

At this stage (lease sale) there are no impacts to water resources. Impacts (both direct and indirect) would occur if and when the lease is developed in the future. The potential impacts would be analyzed on a site-specific basis during the APD stage prior to development.

Leasing parcels that are within surface water of Lake Sakakawea will not have effects to the lake; parcels will include a no surface occupancy (NSO) stipulation preventing surface occupation of the parcel for exploration. However, parcels may still be accessed through horizontal drilling, but that should have no effect on surface water quality. See Appendix A for more detail.

4.4.1 Direct and Indirect Effects

The action of leasing the parcel itself would not have any impact on water resources. The subsequent development of the leases could result in reasonably foreseeable disturbances to hydrologic resources. Stipulations regarding steep slopes, erosive soils, and activities on floodplains and in wetlands would minimize potential impacts (refer to Appendix A).

The development of the lease (construction and operation of well pads, access roads, pipelines, power lines, reserve pits, and other facilities) would create surface disturbances that can subsequently lead to surface and ground water degradation through non-point source pollution. The likelihood and magnitude of these occurrences is dependent upon local site characteristics, climatic events, and the success of specific mitigation measures applied. Potential impacts would be addressed in more detail at the APD stage.

4.4.2 Mitigation

If exploration/development were to occur, a number of measures would be taken to prevent, minimize, or mitigate impacts to water resources. The operator would stockpile the topsoil from the surface of well pads and then use it for surface reclamation. Once this topsoil is applied and vegetation is reestablished, the impacts would be remediated.

The use of plastic-lined reserve pits would reduce or eliminate the risk of drilling fluid seeping into the soil and eventually reaching ground water. Spills or produced fluids (e.g., saltwater, oil, and/or condensate in the event of a breach, overflow, or spill from storage tanks) could result in contamination of the soils onsite or offsite and may potentially impact surface and groundwater resources in the long term. The casing and cementing requirements imposed on proposed wells would reduce or eliminate the potential for groundwater contamination from drilling mud and other surface sources.

Reserve pits would be re-contoured and reseeded as described in the COAs attached to the APD. Upon abandonment of wells and/or when access roads are no longer in service, the authorized officer would issue instructions and/or orders for surface reclamation/restoration of the disturbed areas as described in attached COAs.

Road construction requirements and regular maintenance would alleviate potential impacts to access roads from water erosion damage. To protect slopes or fragile soils, surface disturbance would not be allowed on slopes of more than 30 percent.

Additional mitigation measures and/or BMPs would be assigned once a site-specific plan of development is proposed.

4.5 Vegetation Resources

At this stage (lease sale) there are no impacts to vegetation resources. Impacts (both direct and indirect) would occur when the lease is developed in the future. The potential impacts would be analyzed on a site-specific basis at the APD stage prior to development.

4.5.1 Direct and Indirect Effects

Although there are no direct or indirect impacts to vegetation resources at the leasing stage, the following assumptions can be made about potential future direct and indirect effects at the time of development.

Impacts to native vegetation would depend on the native vegetation type and the level of disturbance of the lease parcels. The lease parcels contain a combination of native prairie, riparian, agricultural lands, improved pastures, and woodland vegetation communities. Habitat disturbance in grasslands generally has less of an impact than disturbance in riparian-wetlands and woodlands. Since shrubs and trees take longer to reestablish, rehabilitation times are expected to be longer than those in grass-dominated areas. Riparian-wetlands can be very sensitive, but natural vegetation can reestablish very quickly as long as disturbances do not alter the structural and functioning components of the site. Agricultural, improved pastures, restored pastures, and other disturbed sites have all been manipulated and disturbed. To return these lands back to their current existing environment would be easier than restoring native vegetation communities. These areas are already seeded with plant species that are competitive in nature that were selected for their ability to establish effectively. Overall, the impacts associated with well pads and roads would be very site-specific and are not expected to significantly affect this vegetation at the community scale. The footprint of the disturbance is also expected to be a small proportion of the habitat area.

Potential impacts to individual plants include direct mortality from earth excavation or crushing by vehicles. Noxious weeds can be introduced by equipment used for developing sites or supporting road systems. If noxious weeds were to establish, further expansion of the noxious weed could continue after ground disturbing activities have been completed. With proper weed control and preventative measures, noxious weed establishment and expansion would be expected to be isolated and short term.

4.6 Special Status Species

At this stage (lease sale) there would be no direct impacts to special status species. Impacts (both direct and indirect) could occur if and when the lease is developed in the future. The potential impacts would be analyzed on a site-specific basis at the APD stage prior to development.

If future development occurs on lease parcels, the use of standard lease terms and stipulations on these lands (refer to Appendix A) would minimize, but not preclude impacts to wildlife. Oil and gas development which results in surface disturbance could directly and indirectly impact aquatic and terrestrial wildlife species. These impacts could include loss or reduction in suitability of habitat, improved habitat for undesirable (non-native) competitors, species or community shift to species or communities more tolerant of disturbances, nest abandonment, mortalities resulting from collisions with vehicles and power lines, electrocutions from power lines, barriers to species migration, habitat fragmentation, increased predation, habitat avoidance, and displacement of wildlife species resulting from human presence. The scale, location, and pace of development, combined with implementation of mitigation measures and the specific tolerance of the species to human disturbance all influence the severity of impacts to wildlife species and habitats, including Threatened, Endangered, Candidate, Proposed, and other special status species.

4.6.1 Direct and Indirect Effects

At this stage (lease sale) there are no impacts to special status species. Any potential effects on wildlife from the sale of lease parcels would occur at the time the lease is developed. Although no impacts occur from the act of leasing, the following are potential effects that could occur at the time of development.

Piping Plover(*Threatened*)/Least Tern (*Endangered*)

Critical habitats have been established in North Dakota for piping plovers. All the lease parcels located along the Missouri River and Lake Sakakawea are within these established critical habitats. Two additional parcels in Mountrail County and one in Divide County also have critical habitat associated with them.

Existing stipulations from the North Dakota RMP (1988) requires a No Surface Occupancy (NSO) stipulation associated with all wetlands (for analysis purposes, Lake Sakakawea is viewed as a wetland by BLM). The stipulation would not allow surface disturbance/development activities to occur within 200 feet of known wetlands. The 200 feet could also be adjusted to accommodate site specific concerns at the APD stage. As a result of this stipulation, impacts are not expected to nesting habitats within these areas. Due to the NSO stipulation associated with wetlands and the identified critical habitats, issuing the proposed lease parcels would have no affect on piping plovers and least terns.

Pallid Sturgeon (*Endangered*)

Potential impacts from development could include: overland oil spills, underground spills from activities associated with horizontal drilling or other practices, spills from drilling mud or other extraction and processing chemicals, and surface disturbance activities that create a localized erosion zone. Oil spills and other pollutants from the oil extraction process could harm the endangered pallid sturgeon in two different ways. First, toxicological impacts from direct contact could have immediate lethal effects to eggs, juveniles, and adults. Second, toxic effects to lower food web levels (e.g. aquatic macro-invertebrates) would indirectly affect the pallid sturgeon species by degrading water quality and degrading or eliminating food resources. Other aquatic species would experience the same type of direct and indirect impacts.

Currently, in the North Dakota RMP there are no stipulations specific to Pallid sturgeon habitat. However, a floodplain stipulation (NSO 11-39 and NSO 11-36, see Appendix A) would not allow surface occupancy in the 100-year floodplain boundary of the Missouri and Yellowstone Rivers, respectively. Additionally, Pallid Sturgeons would be protected by stipulation NSO 11-37 (see Appendix A) which would not allow surface disturbance/development activities to occur within 200 feet of known wetlands. BLM considers the Yellowstone and Missouri Rivers wetlands habitat.

BLM has determined that issuing leases for the parcels along the Missouri River and Lake Sakakawea would have no effect on the pallid sturgeon. If development were to occur, additional mitigation would be included as conditions of approval at the APD stage. These conditions could include the placement of earthen berms and oil skimmers (a culvert device placed in drainages which is intended to block oil from entering streams) which should help protect pallid sturgeon habitat in case of oil spills by greatly reducing the potential for spills to reach pallid sturgeon habitat.

Whooping Crane (*Endangered*)

The majority of the parcels occur in the whooping crane migratory corridor through North Dakota, excluding those in Bowman and Golden Valley counties. BLM has determined that the act of issuing leases within the whooping crane migration corridor would not affect the whooping crane. However, impacts to whooping cranes are possible from subsequent oil and gas development activities that would be permitted at the APD stage. At this time, stipulations are limited to protect any known whooping crane migration staging areas. Line strikes, collisions with vehicles, habitat fragmentation, and other anthropogenic activities can disturb, displace, or cause direct mortality of whooping cranes.

Therefore, if development of these leases in known whooping crane feeding/staging/resting areas is proposed, BLM could consult with the USFWS pursuant to section 7(a)(2) of ESA. An outcome of the conferencing process may be that conditions of approval are attached to the permit or the permit may not be approved. Other BMP's would also be developed through consultation, including minimizing disturbance, adherence to Avian Powerline Interaction Committee (APLIC) guidelines, and others as deemed appropriate.

Dakota Skipper Butterfly (*Candidate*)

The majority of the parcels occur in counties where the Dakota Skipper (skipper) has been positively identified. Bottineau, Burke, Dunn, Mountrail, Ward, and McKenzie all have remaining native prairies that could provide habitat for the skipper to varying degrees. BLM has determined the act of issuing leases within these counties would not affect the skipper due to the butterflies vary specific habitat requirements as explained in Chapter 3. The following assumptions were utilized in this determination.

Approximately 1400 acres of the 5900 proposed acres are native prairies which vary in degrees of historic native species integrity. Most are highly invaded with cool season exotic plants (Kentucky bluegrass and smooth brome) which compete with the native grasses and forbs needed for the skipper's lifecycle. Historically, the nominated parcels have been grazed to varying degrees. Given the highly varied and fragmented landscape due to agricultural practices within the project area and directional drilling techniques employed the probability of surface development on the remaining 23 percent of native prairie lease nominations unlikely.

If any of the nominated parcels are proposed for development, on-site evaluations would be conducted to determine if additional conditions of approval are warranted due to the drilling pads, roads, and collisions with vehicles, habitat fragmentation, and other anthropogenic activities.

Therefore, if development of these leases in known skipper areas are proposed, BLM could consult with the USFWS pursuant to section 7(a)(2) of ESA even though it is a candidate species. An outcome of the conferencing process may be that conditions of approval are attached to the permit or the permit may not be approved. Other BMP's would also be developed through consultation, including minimizing disturbance, adherence to conservation plans and others as deemed appropriate.

Sprague's Pipit (*Candidate*)

Potential suitable habitat exists for the Sprague's pipit on nine of the 35 nominated lease parcels. Seven of the parcels are located in the high or very high areas of potential development based on the RFD discussed above; however one of these parcels (GS) is

stipulated with a NSO under both alternative B and C. Therefore, under alternative B six parcels, approximately 2000 acres remain for leasing in the very high or high development potential areas. Furthermore, three parcels (EN, EH, EK) are proposed to be deferred under alternative C. Therefore, under alternative C, only three parcels totaling approximately 600 acres remain for leasing in the very high or high development potential area designated by the RFD.

Energy development (oil, gas, and wind) and associated roads and facilities increase the fragmentation of grassland habitat. A number of studies have found that Sprague's pipits appear to avoid non-grassland features in the landscape, including roads, trails, oil wells, croplands, woody vegetation, and wetlands (Dale et al. 2009, pp. 194, 200; Koper et al. 2009, pp. 1287, 1293, 1294, 1296; Greer 2009, p. 65; Linnen 2008, pp. 1, 9-11, 15; Sutter et al. 2000, pp. 112-114). Sprague's pipits avoid oil wells, staying up to 350 meters (m)[1148 feet (ft)] away (Linnen 2008, pp. 1, 9-11), magnifying the effect of the well feature itself.

Potential impacts occurring at the time of development could include habitat fragmentation, disturbance of preferred nesting habitat, habitat avoidance, nest abandonment, increase predation, increased vehicle collisions, species shift to disturbance associated species, and preventive barriers to species migration.

If the parcels are developed the avoidance of habitats is highly likely due to the ability to reach the federal subsurface minerals from a previously disturbed area off location. With current directional drilling techniques, preferred placement of well pads could be located as far as 2 miles away from the lease parcels, allowing avoidance of Sprague's Pipit habitats nominated for lease.

Lease notices have been applied to the lease parcels that contain potential Sprague's pipit habitats. If Sprague's pipits are found in the proposed development area, Conditions of Approval would be applied to mitigate the effects of energy development to Sprague's Pipit.

Sage Grouse (*Candidate*)

Research has shown that oil and gas development negatively impacts sage grouse. Based on recent research, the current oil and gas stipulations for sage grouse are considered ineffective to ensure that sage grouse can persist within fully developed areas. With regard to existing restrictive stipulations applied by the BLM, (Walker et al. 2007a) research has demonstrated that the 0.4-km (0.25 miles) NSO lease stipulation is insufficient to conserve breeding sage-grouse populations in fully developed gas fields because this buffer distance leaves 98 percent of the landscape within 3.2 km (2 miles)

open to full-scale development. Full-field development of 98 percent of the landscape within 3.2 km (2 miles) of leks in a typical landscape in the Powder River Basin reduced the average probability of lek persistence from 87 percent to 5 percent (Walker et al. 2007a).

Other studies also have assessed the efficiency of existing BLM stipulations for sage grouse. Impacts to leks from energy development are most severe near the lek, and remained discernable out to distances more than 6 km (3.6 miles) (Holloran 2005, Walker et al. 2007a), and have resulted in the extirpation of leks within gas fields (Holloran 2005, Walker et al. 2007a). Holloran (2005) shows that lek counts decreased with distance to the nearest active drilling rig, producing well, or main haul road, and that development influence counts of displaying males to a distance of between 4.7 and 6.2 km (2.9 and 3.9 miles). All well-supported models in Walker et al. (2007a) indicate a strong effect of energy development, estimated as proportion of development within either 0.8 km (0.5 miles) or 3.2 km (2 miles), on lek persistence. Buffer sizes of 0.25 mi., 0.5 mi., 0.6 mi. and 1.0 mi. result in an estimated lek persistence of 5 percent, 11 percent, 14 percent, and 30 percent. Lek persistence in the absence of CBNG development averages approximately 85 percent. Models with development at 6.4 km (4 miles) had considerably less support, but the regression coefficient indicated that impacts were still apparent out to 6.4 km (4 miles) (Walker et al. 2007a). Tack (2009) found impacts of energy development on lek abundances (numbers of males per lek) out to 7.6 miles.

If the nominated lease parcels are developed this would increase the fragmentation of habitats resulting in a loss of sagebrush utilized for nesting as well as native forbs and grasses associated with brood rearing. Herman-Brunson (2007) suggested habitat selection for nesting and brood rearing hens on the extreme eastern edge of their range tend to include a higher percentage of grasses and a lower percentage of sagebrush than habitats in the core of sage grouse range. Development could displace broods to areas not capable of providing the same quality of habitat necessary for chick survival. In addition, based on prior research, we could expect a downward trend in male lek attendance for lek B-24.

Under Alternative B, sage grouse stipulation NSO-11-35, protects leks and the immediate habitats surrounding the leks up to ¼ mile from the center of the lek. The 1988 RMP stipulation is based on the preference for sage grouse to nest in prime sage brush habitats within ¼ mile of the lek. In 1988 it was primarily thought that most females do not travel beyond ¼ mile for nesting activities.

Alternative B also offers a timing limitation stipulation TL-13-17 which affords protection to active leks from March 1 to June 15 up to 2 miles surrounding the lek. The stipulation

is intended to protect breeding and nesting activities for a portion of the hens that nest within 2 miles of the known lek.

Under alternative C three parcels (EK, EH, EN) within the sage grouse core area would be deferred for further analysis.

Mitigation

Additional measures would be taken to prevent, minimize, or mitigate impacts to fish and wildlife animal species from exploration and development activities at the APD stage. Prior to authorization, activities would be evaluated on a case-by-case basis, and the project would be subject to mitigation measures. Mitigation could include rapid vegetation, project relocation, or pre-disturbance wildlife species surveying. If oil and gas development is proposed in suitable habitat for threatened or endangered species, consultation with the USFWS would occur to determine if additional terms and conditions would need to be applied.

Should future drilling occur, mitigation measures would consider the types of impact, the rareness of the species, the population size, and the species' potential response to the disturbance. Additional COAs would be developed to minimize habitat disturbance; lowering impacts on sensitive animal species at the site-specific scale.

BLM Sensitive Animal Species and Other Fish and Wildlife. Approximately 25-30 of the sensitive species listed for North Dakota have the potential to occur within the study area. Species occurrence and densities tend to be dynamic in nature especially during the seasonal changes experienced within the study area. Annual statewide surveys are completed for trends and do not reflect on individual parcels. Impacts would be dependent on the location of surface disturbance if any drilling activities would take place and would be relative to populations of the species in question.

Should drilling occur on the lease parcels, impacts could include loss of habitat from development infrastructure, mortalities resulting from collisions with vehicles and power lines, electrocution on power lines, and displacement of wildlife species from initial disturbance caused by human presence. Indirect impacts would include habitat fragmentation and subsequent vehicle traffic, human presence, and other continual development activities.

Based on the RFD, a wide range of direct habitat loss is possible. Initial disturbance would change the occupation of those areas to disturbance-oriented species (i.e. horned larks), or species with more tolerance for disturbances. These changes would also be expected to decrease the diversity of wildlife. Although bladed corridors would be

reclaimed after the facilities are constructed, some changes in vegetation would occur along the reclaimed areas. The goal of reclamation is to restore disturbed areas to pre-disturbed conditions. The outcome of reclamation, unlike site restoration, would therefore not always mimic pre-disturbance conditions and offer the same habitat values to wildlife species. Sagebrush obligates, including some species of songbirds and sage grouse, would be most affected by this change.

It is anticipated that some development may occur adjacent to existing disturbances of some type. Depending on proximity and species tolerance, wildlife species within these areas would either have acclimated to the surrounding conditions, previously been displaced by construction activities, or may be caused to be displaced to other areas with or without preferred habitat.

4.7 Fish and Wildlife

At this stage (lease sale), there are no impacts to fish and wildlife. Impacts (both direct and indirect) could occur if and when the lease is developed in the future. The potential impacts would be analyzed on a site-specific basis at the APD stage prior to development.

4.7.1 Direct and Indirect Effects

Should any or all of the nominated parcels be developed in the future, it is expected there would be limited impacts as stated in Section 4.6. However, the BLM would address applications for permits to drill on a case-by-case basis where clear, precise locations can be analyzed for potential impacts. Currently, special stipulations would be placed on the lease nominations where applicable to facilitate resource protection (refer to Appendix A).

4.7.2 Migratory Birds

The leases are in sagebrush/grassland, wetland habitats or prior converted habitats. The majority of the migratory birds of conservation concern occur in native prairie. Some examples of the sagebrush/grassland or grassland species that could be affected by development or disturbance are the Baird's and grasshopper sparrows, McCown's and chestnut-collared longspurs, loggerhead shrike, Sprague's pipit, and the long-billed curlew. The minimal short and long-term disturbance acreage from the Proposed Action, including the application of identified stipulations and avoidance measures, would result in negligible to minor impacts to migratory birds at the site-specific scale and negligible at the population and landscape scales. Also, mitigation measures would be assigned at the development stage (as Conditions of Approval) to mitigate the effects of energy development.

4.7.3 Direct and Indirect Effects

Effects to migratory birds from oil and gas development at the APD stage could include direct loss of habitat from roads, well pads and other infrastructure, disturbance, powerline strikes and accidental direct mortality, fragmentation of habitat, change in use of habitats, and potential threats and competition from edge species.

Mitigation for Migratory Bird Stipulations is the same for both Alt. B and Alt. C. Stipulations protecting Golden Eagles have been placed on four nominated parcels. The stipulation prohibits construction, seismic exploration, or other development from taking place between February 15 and July 15.

Stipulations protecting Ferruginous Hawk have been applied to one parcel. NSO would be allowed within one-half mile of ferruginous hawk nests known to be occupied at least once within the seven previous years and no seismic exploration, construction, or other development would be allowed within ½ miles of occupied nests between March 15 and July 15.

Mitigation measures would be assigned at the APD stage to ensure there would be no measurable negative effects on migratory bird populations, in compliance with Executive Order 13186 and MBTA. These mitigation measures would be required as Conditions of Approval. An NSO stipulation for oil and gas surface disturbing activities in riparian and wetland areas would prohibit any potential oil and gas development in those habitats unless approval was granted through the “waivers, exceptions, and modification” (WEM) process. BLM could coordinate WEMs with USFWS to assure MBTA compliance.

4.8 Cultural Resources

4.8.1 Direct and Indirect Effects

Leasing a nominated parcel gives a basic right to the operator to develop the lease. Leasing would not, however, result in effects to cultural resources at this stage. It is only when the lease is developed that there is a potential for cultural resources to be affected by the proposed action. Lease development is when the drilling location is known and cultural resource investigations can be centered on that location and other related developments such as roads, transmission lines, and pipelines.

Direct and indirect impacts are not anticipated from leasing nominated parcels. It is at the APD stage of development that specific impacts can be correctly assessed. Potential direct impacts to cultural resources at the APD stage include damage to archaeological sites through construction activities (e.g. pad construction, road building, well drilling), increased erosion from surface activities, and increased travel and vandalism resulting from improved access to the area. Potential indirect impacts include abrasive dust and

vibrations from drilling equipment and damage to rock art sites from gas emissions. Conversely, cultural resource investigations associated with development adds to our understanding of the prehistory and history of the area under investigation.

At the APD stage when specific oil and gas development actions are proposed, the area of potential effect (APE) would be defined and assessments of the impacts on cultural resources would be undertaken in order to comply with Section 106 of the National Historic Preservation Act (NHPA) and BLM's 8100 Manual Series. A Class III cultural resource inventory would be necessary for those parcels not previously surveyed and for those parcels which have been judged inadequately surveyed in the past. Lease Notice 16.1 would apply to all parcels (Appendix A). In the event that cultural resources are identified within the APE, an evaluation of National Register eligibility would occur for each identified cultural resource. Mitigation measures for cultural resources determined to be eligible to the National Register of Historic Places (NRHP) would have to be followed for those cultural resources directly and/or indirectly impacted by the proposed development.

Alternative A

No action to lease these parcels would be taken; therefore, there would be no effects to cultural resources.

Alternative B – Proposed Action

The Proposed Action Alternative would be to offer 35 parcels of federal minerals for oil and gas leasing, covering 7,314 acres administered by the NDFO. The parcels are located in western North Dakota. Parcel number, size, and detailed locations and associated stipulations are listed in Appendix A.

Of the 35 parcels proposed for lease, 4 parcels contain a total of 8 previously recorded cultural properties. Of the 8 recorded sites, 6 sites are unevaluated or have an unknown status for the National Register of Historic Places (NRHP); and 2 sites have been determined to be not eligible for the NRHP. Sites located inside the parcels include 1-Archaeological-Cultural Material Scatter; 2-Archaeological Lithic Scatter Sites; 1-Isolated Find that contains Knife River Flint Lithic Flakes; 2-Historic Overhead Transmission Lines; 1-Historic Rail Road; and 1-Historic Site Lead—Post Office. Sites considered not eligible for the NRHP include the Isolated Find and the Site Lead.

Alternative C – Preferred Alternative

The BLM Preferred Alternative would be to offer 32 parcels of federal minerals for oil and gas leasing, covering 5,908 acres administered by the NDFO. Parcel number, size,

and detailed locations and associated stipulations are listed in Appendix A. Current RMP stipulations would be applied.

The following three parcels would be deferred due to Sage Grouse Concerns; NDM 97300-EH, NDM 97300-EK, and NDM 97300-EN.

Of the 32 parcels proposed for lease, 4 parcels contain a total of 8 previously recorded cultural properties. Of the 8 recorded sites, 6 sites are unevaluated or have an unknown status for the National Register of Historic Places (NRHP); and 2 sites have been determined to be not eligible for the NRHP. Sites located inside the parcels include 1-Archaeological-Cultural Material Scatter; 2-Archaeological Lithic Scatter Sites; 1-Isolated Find that contains Knife River Flint Lithic Flakes; 2-Historic Overhead Transmission Lines; 1-Historic Rail Road; and 1-Historic Site Lead—Post Office. Sites considered not eligible for the NRHP include the Isolated Find and the Site Lead.

4.8.2 Mitigation

Specific mitigation measures, such as site avoidance or data recovery through excavation, would have to be determined when project specific development proposals are received. In almost all situations, direct impacts to cultural resources could be avoided by relocating well sites and pipelines. Given the relatively small number of acres to be disturbed by anticipated development it is unlikely that it would be necessary to mitigate adverse impacts to archaeological sites through data recovery efforts. It should be noted that BLM has discretionary control over mitigation stipulations measures imposed on a project. Although a lessee has a right to develop a lease, BLM may require development activities to be moved up to 200 meters in any direction. This should allow nearly all sites to be avoided. Should development uncover subsurface sites, the lessee is required to halt all work until the site can be evaluated and proper mitigation measures can be implemented

Each nominated lease parcel would have the standard lease notice attached and the special cultural resource stipulation as written in IM 2005-003. Refer to Appendix A of this document for pertinent parcel-specific lease stipulations as needed.

4.9 Native American Religious Concerns

4.9.1 Direct and Indirect Effects

At the lease sale stage no impacts have been identified to Native American religious practices and Traditional Cultural Properties (TCPs). Impacts (both direct and indirect) could occur to these types of resources (should any be found) if and when the lease parcels are developed in the future. The potential impacts would be analyzed on a site-specific basis at the APD stage prior to development.

The BLM WO IM-2005-003 notes that a lease sale does not authorize specific on-the-ground activities, and no ground disturbance can occur without further authorization from BLM and the surface management agency. However, unless proscribed by stipulation, lessees can expect to drill somewhere on a lease parcel unless precluded by law. As such, a lease sale would not interfere with the performance of traditional ceremonies and rituals pursuant to the American Indian Religious Freedom Act (AIRFA) or EO 13007. It would not prevent tribes from visiting sacred sites or prevent possession of sacred objects. If such properties were subsequently identified on a lease parcel, stipulations could be identified which would reduce potential conflicts during the periods of oil and gas development and production.

Alternative A

No action to lease these parcels would be taken; therefore, there would be no effects to Native American religious concerns.

Alternative B

The Proposed Action Alternative would be to offer 35 separate parcels of federal minerals for oil and gas leasing covering 7,314 acres administered by the NDFO. The parcels are located in western North Dakota. Parcel number, size, and detailed locations and associated stipulations are listed in Appendix A. A review of the lease parcels and scoping for information indicates that no previously reported TCPs would be directly or indirectly impacted by the proposed lease sale. None of the 35 lease parcels are located inside the exterior boundary of the Fort Berthold Indian Reservation. Information pertaining to TCP's and culturally sensitive areas was requested for all 35 lease parcels (Class I Report with Cover Letter Dated July 13, 2011). No information on areas of concern was received, and no information pertaining to sensitive cultural areas was delineated inside the lease parcels.

For those parcels where no inventory data is available or where no information is available for TCPs, BLM is proposing to apply Standard Lease Notice 16-1.

Alternative C

The BLM Preferred Alternative would be to offer 32 parcels of federal minerals for oil and gas leasing, covering 5,908 acres administered by the NDFO. Parcel number, size, and detailed locations and associated stipulations are listed in Appendix A. Current RMP stipulations would be applied.

The following three parcels would be deferred due to Sage Grouse Concerns; NDM 97300-EH, NDM 97300-EK, and NDM 97300-EN.

A review of the lease parcels, and scoping, indicates that no previously reported TCPs would be directly or indirectly impacted by the proposed lease sale. None of the 32 lease parcels are located inside the exterior boundary of the Fort Berthold Indian Reservation. Information pertaining to TCP's and culturally sensitive areas was requested for all 35 lease parcels (Class I Report with Cover Letter Dated July 13, 2011). No information on areas of concern was received and no information pertaining to sensitive cultural areas was delineated inside the lease parcels.

For those parcels where no inventory data is available or where no information is available for TCPs, BLM is proposing to apply Standard Lease Notice 16-1.

No action to lease these parcels would be taken; therefore, there would be no effects in Alternative A. Direct and indirect impacts would be less for Alternative C than Alternative B, based on the recommendation for deferral of three lease parcels (NDM 97300-EH, NDM 97300-EK, and NDM 97300-EN).

4.10 Paleontology

4.10.1 Direct and Indirect Effects

Significant paleontological resources occur regularly on land underlain by the Hell Creek and Ludlow formations in western North Dakota. The surface disturbances associated with oil and gas exploration and development activities could have direct and indirect effects to paleontological resources primarily in areas classified as Potential Fossil Yield Classification (PFYC) 4 or 5 areas. Mitigation would be a consideration for all surface-disturbing activities. The Niobrara, Pierre Shale, Fox Hills, Bullion Creek, Arikaree formations and the White River Group (Brule and Chadron formations), are also known for significant fossil finds in North Dakota; however, these finds are not common. Isolated significant finds can also occur in most of the geologic formations or units in the state.

As a section of the Omnibus Public Lands Act (March 30, 2009), the Paleontological Resources section of the Act (Title VI, Subtitle D) specifically addressed management of paleontological resources on public lands. As a result of this act, a map of the planning area which shows the area according to its potential fossil yield was developed to provide a tool for predicting the potential management areas have for fossil locales. The BLM PFYC classification system outlines BLM's approach to assessment and mitigation of paleontological resources. The PFYC system uses five classes for geologic units: Class 1: Very Low; Class 2, Low; Class 3, Moderate (3a), or Unknown (3b); Class 4, High; and Class 5, Very High. This classification approach is meant to reflect the probability of impacting significant fossils. The intent of the classification system is to eliminate or reduce adverse impacts to paleontological resources from authorized actions.

Alternative A

No action to lease these parcels would be taken; therefore, there would be no effects to Paleontological resources.

Alternative B

Of the 35 nominated lease parcels, eleven parcels are in areas classified as high according to the PFYC system map (NDM 97300- IC, IX, IZ, I8, I0, JR, JT, JV, JW, KN, and KM). The remaining nominated parcels are located in areas considered moderate or unknown for paleontological resources. Presently, there are no known localities or previous research areas for significant fossil or paleontological resources inside or adjacent to the nominated parcels; therefore, the potential for direct or indirect affects to paleontological resources is low.

Alternative C

Eleven of the 32 lease parcels totaling (2,056.56 federal mineral acres) in whole or in part are within areas classified as high according to the PFYC, (NDM 97300- IC, IX, IZ, I8, I0, JR, JT, JV, JW, KN, and KM). The remaining nominated parcels are located in areas considered moderate or unknown for paleontological resources. Presently, there are no known localities or previous research areas for significant fossil or paleontological resources inside or adjacent to the nominated parcels; therefore, the potential for direct or indirect affects to paleontological resources is low.

4.10.2 Mitigation

Specific mitigation measures would include, but are not limited to, site avoidance or excavation. These measures would be determined when site-specific development proposals are received. For known highly significant paleontological resources, the act of leasing a nominated parcel would not impact paleontological resources; however, subsequent development could have impacts on those resources. For areas known to contain or have the potential to contain paleontological resources, such as PFYC Class 3, 4, and 5, a survey would be conducted in areas of specific development according to Lease Notice 14-12.

As per Washington Office Instruction Memorandums (IM) 2008-009, 10/15/2007 and 2009-011, 10/10/2008, each nominated lease parcel would have the standard lease notice and special paleontological resource stipulation attached. Refer to Appendix A of this document for parcel-specific lease stipulations.

4.11 Lands and Realty

4.11.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on lands and realty. Any potential effects from the sale of leases would occur at the time the leases are developed.

Facilities associated with oil and gas development on the parcels could cause disturbance to the existing rights-of-way on federal surface on one of the five tracts (Parcel NDM 97300-EH). Additional rights-of-way could be required across federal surface for “off-lease” or third party facilities required for potential development of the parcel.

4.11.2 Mitigation

Measures would need to be taken to avoid disturbance to or impacting the one existing rights-of-way on federal surface on parcel NDM 97300-EH in the event of any exploration and development activities on the leased parcel. Any new “off-lease” or third party rights-of-way required across the federal surface for future exploration and/or development would be subject to stipulations to protect other resources as determined by environmental analyses which would be completed on a case-by-case basis.

4.12 Minerals

4.12.1 Fluid Minerals

Stipulations applied to various areas with respect to occupancy, timing limitation, and control of surface use would have the greatest effects on oil and gas exploration and development. Leases issued with major constraints such as no surface occupancy may decrease some lease values, increase operating costs, and, to a lesser extent, require relocation of well sites and modification of field development. Leases issued with moderate constraints such as timing limitations and controlled surface use stipulations may result in similar but reduced impacts and delays in operations and uncertainty on the part of operators regarding restrictions.

If areas are deferred, some development plans could be delayed, relocated, or completely dropped because of the need to include federal acreage as part of an exploration or development plan.

4.12.1.1 Direct and Indirect Effects

Under the Proposed Action, all of the lease parcel areas would be recommended for oil and gas leasing at this time. Approximately 36 percent of the areas would be offered for lease subject to major constraints. Approximately 64 percent would be offered for lease subject to moderate constraints. No parcels would be offered for lease subject only to standard terms and conditions.

4.12.2 Solid Minerals

4.12.2.1 Direct and Indirect Effects

Coal

None of the parcels fall within the boundaries of existing coal mines. Thus, there are no conflicts between the proposed lease parcels and existing coal mines and coal leases.

Therefore, the special stipulation pertaining to surface coal mines does not need to be applied.

It is the policy of the BLM to encourage oil and gas and coal companies to resolve conflicts between themselves; when requested, the BLM would assist in facilitating agreements between the companies. The BLM would also exercise authority provided in the leases, applicable statutes, and regulations to manage federal mineral development in the public's best interest (Washington Office IM 2003-253).

Locatables

There is currently no locatable mineral production or potential for production in the lease parcel areas. If potential mineral development conflicts arise in the future, issues would be addressed during the APD review process, and/or the conflict would be resolved between the private parties through customary corporate and legal procedures.

Salables

Salable minerals would be addressed at the APD stage. However, disposal of salable minerals is a discretionary decision of the authorized officer and thus future potential resource development conflicts would be avoided either by not issuing sales contracts in oil and gas development locations or conditioning the APD or sand and gravel contract to avoid conflicts between operations

4.13 Visual Resources

4.13.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on visual resources. Any potential effects from the sale of leases would occur at the time the leases are developed.

While the act of leasing federal minerals produces no visual impacts, subsequent development (indirect effects) of a lease parcel would result in some level of modification to the existing landscape.

4.13.2 Mitigation

All new oil and gas development would implement, as appropriate for the site, BLM Best Management Practices for Visual Resource Management (VRM), regardless of the VRM class. This includes, but would not be limited to, proper site selection, reduction of visibility, minimizing disturbance, selecting color(s)/color schemes that blend with the background and reclaiming areas that are not in active use. Repetition of form, line, color and texture when designing projects would reduce contrasts between landscape and development. Wherever practical, no new development would be allowed on ridges or mountain tops. Overall, the goal would be to maintain the visual qualities or scenic value that currently exists.

4.14 Recreation and Travel Management

4.14.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on recreation and travel management. Any potential effects from the sale of leases would occur at the time the leases are developed.

Recreation impacts may exist where oil and gas development and recreational user conflicts may occur. In areas where a high level of oil and gas development is likely, there may be user conflicts between motorized recreationists (OHV activities), hunting, target shooting, camping, fishing, river use, picnicking, and winter activities such as snowmobiling and the oil and gas/industrial activities. The intensity of these impacts is moderate and could exist in both the short-term (exploration and construction phases of oil and gas development) and in the long-term (producing wells, maintenance of facilities, etc.).

Where there are other land use activities occurring, including oil and gas development, in areas frequented by recreationists, the public may perceive these areas as inaccessible or unavailable because of the facilities or recreationists may use lease roads to access areas for recreational activities. Potential public safety hazards/risks include: moving equipment, operator vehicles, transport vehicles for oil and gas, oil and gas wells, etc. However, this would be addressed in more detail at the development stage.

As oil and gas development occurs, new routes may be created which often attract recreationists seeking additional or new areas to explore for motorized recreational opportunities. Motorized recreational opportunities could be enhanced through the additional opportunities to explore; however, user conflicts and public safety issues could result from the use of the new travel routes. The creation of routes from oil and gas activities could lead to a proliferation of user-created motorized routes, resulting in adverse impacts to the scenic qualities of the area and increased level of surface disturbance. These impacts would be isolated to BLM-administered public lands and could be minimized and avoided through mitigation and reclamation of industrial routes when no longer needed.

Foreseeable changes in recreation use levels include demand for recreational use of public land to increase. Increases could be expected in, but not limited to, hunting, fishing, hiking, camping, wildlife viewing, and dispersed recreational uses. This could increase the incidence of conflict between recreationists involved in motorized activities and non-motorized activities.

4.15 Livestock Grazing

4.15.1 Direct and Indirect Effects

At this stage (lease sale) there would be no impacts to livestock grazing. Impacts (both direct and indirect) would occur if a lease is developed in the future. The potential impacts would be analyzed on a site specific basis prior to oil and gas development and during the APD stage of development.

Impacts possible at the APD stage of development would include a loss of forage as a result of drill-site development which includes the pad, reserve pit, earthen pit, roads, surface facilities, pipelines, powerlines, and herbicide use. In some cases there may be a temporary loss of AUMs. Short term shifts in grazing intensities, cattle distribution, and utilization levels could occur as a worst case scenario. The cumulative number of AUMs removed from a grazing allotment would have to be considered at the APD stage of development. Short-term and long-term impacts associated with AUM losses would be apparent in rangeland monitoring efforts.

Under Alternative C the parcels nominated which are located within BLM grazing allotments would be deferred. Under this alternative, potential impacts would not be expected, due to no potential development.

4.15.2 Mitigation

Mitigation would be deferred to the site specific APD stage of development. BMPs would be incorporated into COAs.

Fencing of facilities would be considered as needed to minimize conflicts between oil and gas exploration/development and livestock grazing. Well locations should not be placed in a location that would impair range improvement usefulness and maintenance. Any linear features (i.e. roads and pipelines) that disturb range improvements should mitigate such disturbance by repairing the range improvement to the prior condition or better.

4.16 Economic Conditions

4.16.1 Direct and Indirect Effects

Alternative A:

Economic impacts associated with Alternative A would be similar to those described in the economic section of the Affected Environment. Table 4.16.1 displays the basis for economic effects from BLM management of all oil and gas related activities in North Dakota. Table 4.16.2 displays the economic impacts of each alternative related to the 7,314 acres that have been nomination and for which a leasing decision would be made based on this environmental analysis.

Activity	Alternative		
	A	B	C
Existing Acres leased*	960,583	960,583	960,583
Existing Acres Leased (BLM)	207,656	207,656	207,656
Acres that would be leased based on this EA	0	7,314	5,908
Total acres leased	207,656	214,970	213,564
Acres held by production*	120,086	120,086	120,086
Total acres leased for which lease rents would be paid	87,570	94,884	93,478
Annual average federal lease and rent revenue	\$35,483,596	\$35,874,376	\$35,799,254
Lease and rent revenues distributed to the state	\$14,448,920	\$14,608,046	\$14,577,456
Lease and rent revenues distributed to counties	\$12,490,226	\$12,627,780	\$12,601,338
Annual oil production from BLM leases (bbl)**	1,592,658	1,631,643	1,620,859
Annual gas production from BLM leases (MCF)**	1,953,339	2,001,154	1,987,927
Average annual federal oil and gas royalty	\$18,127,888	\$18,571,627	\$18,448,881
Average annual royalties distributed to the state	\$7,381,676	\$7,562,366	\$7,512,384
Average annual royalties distributed to counties	\$3,982,697	\$4,080,186	\$4,053,219
Total annual Federal revenues	\$53,611,484	\$54,446,002	\$54,248,136
Total annual State/local revenues	\$21,830,596	\$22,170,412	\$22,089,841
Total annual revenue distributed to counties	\$16,472,923	\$16,707,967	\$16,654,557
*LR2000, BLM, 2011			
**Assumes production from BLM leases equal about 22% of 2010 total federal production			

4.16.1 Summary of Estimated Annual Economic Impacts by Alternative

Alternative	Acres Available for Lease	Change in Revenue to Local Counties	Change in Total Employment (full and part-time jobs)	Change in Total Local Wage and Proprietor's Income (\$1000)	Change in Local Population	Change in Number of Households

Alt. A	0	0	0	0	0	0
Alt. B	7,314	\$235,044	83	\$4,886	110	49
Alt. C	5,908	\$181,634	67	\$3,938	88	40

4.16.2 Comparison of Estimated Average Annual Economic Impacts

Alternatives B:

Economic impacts of Alternative C are summarized in Tables 4.16.1, 4.16.2, and 4.16.3.

Public Revenues related to leasing, rent, and production:

Leasing an additional 7,314 acres of federal minerals would increase estimated annual oil and gas leasing and rent revenues to the federal government by \$391,000. Estimated annual leasing and rent revenues to the state would increase by about \$159,000 and revenues distributed to counties would increase by about \$138,000. Average annual federal oil and gas royalties would increase by an estimated \$444,000. Average annual production royalties would increase by an estimated \$181,000 to the state and \$97,000 to the counties. Total average annual bonus, rent, and royalty revenues would increase by about \$835,000 to the federal government, \$340,000 to the state, and \$235,000 to counties.

Local Economic Contribution:

The estimated combined total annual employment and income supported by federal oil and gas leasing, distributions of royalties to local governments, drilling wells, and production would amount to about 2,530 total jobs and \$148.0 million within the local economy (IMPLAN, 2009). Table 4.16.2 shows that this would be an annual increase of about 80 total jobs and \$4.9 million in labor income over levels anticipated with Alternative A. There would also be a corresponding increase in local population of about 110 people and 50 households.

Conclusion: Total federal contribution of leasing an additional 7,314 acres of BLM-managed federal minerals and anticipated related exploration, development, and production of oil and gas would have negligible effects on local population, total local employment, number of households, average income per household, and total personal income, e.g. the effects would be less than 0.1 percent of current levels and the effects would be spread over a 15 county area. The economic effects would continue to be spread unevenly among the counties. Leasing the additional acres and anticipated

exploration, development, and production would provide about \$340,000 per year of additional funds for North Dakota and for public school systems and county functions such as maintaining roads and highways, enforcing laws, administering justice, collecting and disbursing tax funds, providing for orderly elections, providing fire protection, keeping records, operating clinics/hospitals, county libraries, county airports, local landfills, and county health systems. Demand for these services would also increase as total local employment and population increase. Leasing the additional acres and anticipated exploration, development, and production would not change local economic diversity (as indicated by the number of economic sectors), economic dependency (where one or a few industries dominate the economy), or economic stability (as indicated by seasonal unemployment, sporadic population changes and fluctuating income rates).

Public Revenues related to leasing, rent, and production:

Leasing an additional 5,908 acres of federal minerals would increase estimated annual oil and gas leasing and rent revenues to the federal government by \$316,000. Estimated annual leasing and rent revenues to the state would increase by about \$129,000 and revenues distributed to counties would increase by about \$111,000. Average annual federal oil and gas royalties would increase by an estimated \$321,000. Average annual production royalties would increase by an estimated \$131,000 to the state and \$71,000 to the counties. Total average annual bonus, rent, and royalty revenues would increase by about \$637,000 to the federal government, \$259,000 to the state, and \$182,000 to counties.

Local Economic Contribution:

The estimated combined total annual employment and income supported by federal oil and gas leasing, distributions of royalties to local governments, drilling wells, and production would amount to about 2,520 total jobs and \$147.1 million within the local economy (IMPLAN, 2009). Table 4.16.2 shows that this would be an annual increase of about 70 total jobs and \$3.9 million in labor income over levels anticipated with Alternative A. There would also be a corresponding increase in local population of about 90 people and 40 households.

Conclusion:

Total federal contribution of leasing an additional 5,908 acres of BLM-managed federal minerals and anticipated related exploration, development, and production of oil and gas would have negligible effects on local population, total local employment, number of households, average income per household, and total personal income, e.g. the effects would be less than 0.1 percent of current levels and the effects would be spread over a 15 county area. The economic effects would continue to be spread unevenly among the counties. Leasing the additional acres and anticipated exploration, development, and production would provide about \$340,000 per year of additional funds for North Dakota

and for public school systems and county functions such as maintaining roads and highways, enforcing laws, administering justice, collecting and disbursing tax funds, providing for orderly elections, providing fire protection, keeping records, operating clinics/hospitals, county libraries, county airports, local landfills, and county health systems. Demand for these services would also increase as total local employment and population increase. Leasing the additional acres and anticipated exploration, development, and production would not change local economic diversity (as indicated by the number of economic sectors), economic dependency (where one or a few industries dominate the economy), or economic stability (as indicated by seasonal unemployment, sporadic population changes and fluctuating income rates).

Alternatives C:

Economic impacts of Alternative C are summarized in Tables 4.16.1, 4.16.2, and 4.16.3.

Public Revenues related to leasing, rent, and production:

Leasing an additional 5,908 acres of federal minerals would increase estimated annual oil and gas leasing and rent revenues to the federal government by \$316,000. Estimated annual leasing and rent revenues to the state would increase by about \$129,000 and revenues distributed to counties would increase by about \$111,000. Average annual federal oil and gas royalties would increase by an estimated \$321,000. Average annual production royalties would increase by an estimated \$131,000 to the state and \$71,000 to the counties. Total average annual bonus, rent, and royalty revenues would increase by about \$637,000 to the federal government, \$259,000 to the state, and \$182,000 to counties.

Local Economic Contribution:

The estimated combined total annual employment and income supported by federal oil and gas leasing, distributions of royalties to local governments, drilling wells, and production would amount to about 2,520 total jobs and \$147.1 million within the local economy (IMPLAN, 2009). Table 4.16.1 shows that this would be an annual increase of about 70 total jobs and \$3.9 million in labor income over levels anticipated with Alternative A. There would also be a corresponding increase in local population of about 90 people and 40 households.

Conclusion:

Total federal contribution of leasing an additional 5,908 acres of BLM-managed federal minerals and anticipated related exploration, development, and production of oil and gas would have negligible effects on local population, total local employment, number of households, average income per household, and total personal income, e.g. the effects would be less than 0.1 percent of current levels and the effects would be spread over a 15

county area. The economic effects would continue to be spread unevenly among the counties. Leasing the additional acres and anticipated exploration, development, and production would provide about \$340,000 per year of additional funds for North Dakota and for public school systems and county functions such as maintaining roads and highways, enforcing laws, administering justice, collecting and disbursing tax funds, providing for orderly elections, providing fire protection, keeping records, operating clinics/hospitals, county libraries, county airports, local landfills, and county health systems. Demand for these services would also increase as total local employment and population increase. Leasing the additional acres and anticipated exploration, development, and production would not change local economic diversity (as indicated by the number of economic sectors), economic dependency (where one or a few industries dominate the economy), or economic stability (as indicated by seasonal unemployment, sporadic population changes and fluctuating income rates).

4.17 Social and Environmental Justice

4.17.1 Direct and Indirect Effects

Management Common to All Alternatives

No alternative would affect the demographics, social trends, or social organization in the area.

Alternative A

The No Action alternative would result in the continuation of the current land and resource uses and would cause no social or environmental justice impacts.

Alternative B

While the act of leasing federal minerals itself would result in no social impacts, subsequent development of a lease may generate impacts to people living near or using the area in the vicinity of the lease. Oil and gas exploration, drilling, or production could create an inconvenience to these people due to increased traffic and traffic delays, air pollution, noise and visual impacts. This could be especially noticeable in rural areas where oil and gas development has been minimal. The amount of inconvenience would depend on the activity affected, traffic patterns within the area, noise levels, length of time, and season these activities occurred. Creation of new access roads into an area could allow increased public access and exposure of private property to vandalism. For leases where the surface is privately owned and the subsurface is BLM managed, surface owner agreements, standard lease stipulations, and BMPs could address many of the concerns of private surface owners.

Employment and associated population increases discussed in the economic section above would be more likely to occur in the larger communities where the social effects would be less noticeable. Any new employment and population would probably be welcomed in the very small communities that are currently losing population. There would also be an increase in revenues that accrue to the counties where production occurs. Depending on where production actually occurs, these revenues would benefit any receiving county but would be more notable in counties with smaller populations and less current revenue. See Direct and Indirect Effects to Economic Conditions.

There would be no disproportionate effects to low income or American Indian populations from the leasing. If and when lease parcels are developed in the future, effects to American Indians would be analyzed on a case by case basis at the APD state prior to development. In addition to American Indian populations, there are low income people in the counties, but they do not appear to be associated with any specific BLM resources or activities.

Alternative C

The social effects would be similar to Alternative B but potentially of a lower magnitude because less land is being leased.

4.18 Cumulative Impacts

Cumulative impacts are those impacts resulting from the incremental impact of an action when added to other past, present, and reasonably foreseeable actions regardless of what agency or person undertakes such other actions. This section describes cumulative impacts associated with this project on resources. The ability to assess the potential cumulative impacts at the leasing stage for this project is limited for many resources due to the lack of site-specific information for potential future activities. Upon receipt of an APD for any of the lease parcels addressed in this document, more site-specific planning would be conducted in which the ability to assess contributions to cumulative impacts in a more detailed manner would be greater due to the availability of more refined site-specific information about proposed activities.

4.18.1 Past, Present and Reasonably Foreseeable Future Actions

Past, present, or reasonably foreseeable future actions that have or could affect the same components of the environment as the Proposed Action in project area include mineral exploration and development, livestock grazing and range improvements, road construction, agriculture, recreational activities, subdivision of private lands,

energy/utility infrastructure development, vehicle travel, wild and prescribed fire activities and water flow alterations and diversions. Much of this activity has, and is expected to continue, occurred on private surface lands, which comprise a majority of the total land ownership in the project area.

4.18.2 Cumulative Impacts by Resource

4.18.2.1 Greenhouse Gas Emissions and Cumulative Impacts on Climate Change

The cumulative effects analysis area for air resources is the NDFO, with additional discussion at statewide, national, and global scales for GHG and climate change.

This section incorporates an analysis of the contributions of the Proposed Action to GHG emissions, followed by a general discussion of potential impacts to climate change. Potential emissions relate to those derived from potential exploration and development of fluid minerals. Additional emissions beyond the control of the BLM, and outside the scope of this analysis, would also occur during any needed refining processes as well as the end uses of final products.

Projected GHG emissions for this project and the NDFO RFD are compared below with recent, available inventory data at the state, national, and global scales. GHG emissions inventories can vary greatly in their scope and comprehensiveness. State, national, and global inventories are not necessarily consistent in their methods or in the variety of GHG sources that are inventoried (Climate Change SIR, 2010). However, comparisons of emissions projected by the BLM for its oil and gas production activities are made with those from inventories at other scales provide a context for the potential contributions of GHGs associated with this project.

As discussed in the Air Quality section of Chapter 4, total long-term projected BLM GHG emissions from the RFD are 527,350 metric tons/year CO₂e. Potential emissions under Alternative B would be approximately 0.6 percent of this total. Table 4.18.1 displays projected GHG emissions from non-BLM activities included in the NDFO RFD. Total projected emissions of non-BLM activities in the RFD are 4,369,454 metric tons/year of CO₂e. When combined with projected annual BLM emissions, this totals 4,896.8 metric tons/year CO₂e. Potential GHG emissions under Alternative B would be 0.121 percent of the estimated emissions for the entire RFD. Potential incremental emissions of GHGs from exploration and development of fluid minerals under Alternative B would be minor in the context of projected GHG contributions from the entire RFD for the NDFO.

Table 4.18.1. Projected non-BLM GHG emissions associated with the North Dakota FO Reasonably Foreseeable Development Scenario for fluid mineral exploration and development.

Source	Non-BLM Long-Term Greenhouse Gas Emissions in tons/year				Emissions (metric tons/yr)
	CO ₂	CH ₄	N ₂ O	Co ₂ e	CO ₂ e
Conventional Natural Gas	4,273.3	850.9	0.05	22,156.4	20,105.8
Coal Bed Natural Gas	32,407.3	412.2	0.58	41,243.1	37,425.8
Oil	4,538,510.4	17,153.1	52.69	4,751,738.5	4,311,922.4
Total	4,575,191	18,416.2	53.37	4,815,138	4,369,454

North Dakota's Contribution to U.S. and Global Greenhouse Gases (GHGs)

While North Dakota has not completed a GHG inventory, the “CRS Report to Congress: State Greenhouse Gas Emissions Comparison and Analysis” reports that emissions are 57 million metric tons of carbon equivalent (MMTCO₂E) compared to 6,737 million metric tons nationally (Ramseur 2007, http://assets.opencrs.com/rpts/RL34272_20071205.pdf). This equates to approximately 0.8 percent of U.S. and 0.1 percent of global emissions. Individual source groups are not available but are likely similar to those in Montana.

GHG emissions were inventoried for North Dakota, but include CO₂ emissions from fossil fuel combustion only. In 2007, these total emissions were approximately 49 million metric tons of CO₂e (summarized in Climate Change SIR, 2010). Alternative B represents approximately 0.01 percent of these total GHG emissions based on the 2007 inventory.

The EPA (Climate Change SIR, 2010) published an inventory of U.S. GHG emissions which indicated gross U.S. emissions of 6,957 million metric tons and net emissions of 6,016 million metric tons (when CO₂ sinks were considered) of CO₂e in 2008. Potential annual emissions under Alternative B would amount to approximately 0.00005 percent of gross U.S. total emissions. Global GHG emissions for 2004 (Climate Change SIR, 2010) indicated approximately 49 gigatonnes (10⁹ metric tons) of CO₂e emitted. Potential annual emissions under Alternative B would amount to approximately 0.000006 percent of this global total.

As indicated in the Air Quality section of Chapter 4 above, although the effects of greenhouse gas emissions in the global aggregate are well-documented, it is currently not credibly possible to determine what specific effect GHG emissions resulting from a particular activity might have on climate or the environment. If exploration and development occur on the lease parcels considered under Alternative B, potential GHG emissions described above would incrementally contribute to the total volume of GHGs emitted to the atmosphere, and ultimately to climate change.

Mitigation measures identified in the Air Quality section of Chapter 4 above may be in place at the APD stage to reduce GHG emissions from potential oil and gas development as a result of this project. This is likely because many operators working in Montana, South Dakota, and North Dakota are currently EPA Natural Gas STAR Program Partners, and future regulations may require GHG emission controls for a variety of industries, including the oil and gas industry (Climate Change SIR, 2010).

4.18.2.2 Cumulative Impacts of Climate Change

As previously discussed in section 4.1.1, it is difficult to impossible to identify the specific impacts of climate change on specific resources within the project area. Some information and projections of impacts beyond the project scale are becoming increasingly available. Chapter 3 of the Climate Change SIR (2010) describes impacts of climate change in detail at various scales, including the state scale when appropriate. Effects of climate change on resources are described in Chapter 3 of this EA and in Climate Change SIR (2010).

4.18.2.3 Cumulative Impacts of Other Resources

Although impacts are discussed by pertinent resource below, the Proposed Action, when considered in combination with other past, present and reasonably foreseeable activities occurring on federal, state, and private lands, would not significantly contribute to any cumulative impacts. The ability to assess the potential cumulative impacts at the leasing stage for this project is limited for many resources due to the lack of site-specific information for potential future activities. Upon receipt of an APD for any of the lease parcels addressed in this document, more site-specific planning would be conducted in which the ability to assess contributions to cumulative impacts in a more detailed manner would be greater due to the availability of more refined site-specific information about proposed activities.

Soil Resources

In general, the above actions could have cumulative impacts on soil resources by causing surface disturbance which contribute to soil compaction, erosion, and subsequent sedimentation. Some of these impacts can be mitigated or avoided through proper design, construction, maintenance, and implementation of BMPs at the site-specific planning stage.

Water Resources

Where facilities cross or are close to waterways, the likelihood of project impacts would increase. These impacts could include increased sedimentation; increased salt loading; contamination by petroleum products, chemicals, or produced waters; and flow alterations. Similarly, possible leaks from reserve and evaporation pits could degrade

surface and ground water quality. Impacts can be reduced or avoided through proper project design, construction, maintenance activities, and implementation of best management practices.

Specific locations, development techniques, and mitigation procedures are undeveloped as of yet; therefore, specific descriptions of potential effects are unattainable at this time. Authorization of proposed projects would require full compliance with BLM directives and stipulations that relate to surface and groundwater protection.

Vegetation

In general, the above actions could have cumulative impacts on vegetative resources including the direct destruction of vegetation through earth moving, vehicle traffic, limited vegetative production through soil compaction and limited water infiltration, and introduction of invasive and/or noxious weed species.

Fish and Wildlife

Generally speaking construction of roads, production of well pads, and other facilities would result in long term (>5 years) loss of habitat and forage in the analysis area if the leases are developed. This would be in addition to acres disturbed, or habitats fragmented from various other adjacent activities. As new development occurs, direct and indirect impacts would continue to stress wildlife populations, most likely displacing the larger, mobile animals into adjacent habitat, and increasing competition with existing local populations. Non-mobile animals would be affected by increased habitat fragmentation and interruptions to preferred nesting habitats.

Certain species are localized to some areas and rely on very key habitats during critical times of the year. Disturbance or human activities that would occur in winter range for big game, nesting and brood-rearing habitat for grouse and raptors could displace some or all of the species using a particular area or disrupt the normal life cycles of species. Wildlife and habitat in and around the project would be influenced to different degrees by various human activities. Some species and/or a few individuals from a species group may be able to adapt to these human influences over time.

Cultural Resources

Federal undertakings are required to comply with the National Historic Preservation Act and adverse effects mitigated. Non-federal undertakings on private lands as identified above can lead to artifact breakage, compaction, and mixing of temporal assemblages and vandalism.

Economics

Cumulative Effects: The cumulative effects of federal mineral leasing within the local economy as well as the specific effects of leasing an additional 7,314 acres are presented in the previous analysis. These effects are summarized in Tables Econ.2, 3, and 4.

Total annual federal revenues related to leasing 214,970 acres of federal minerals and associated annual rent and royalty revenues related to annual production of federal minerals would amount to an estimated \$54.4 million. This would be an estimated annual increase of \$835,000 compared to current management and Alternative A. Total annual revenues distributed to the state and counties would increase by about \$340,000 and \$235,000 respectively, over current management and Alternative A. Total estimated annual revenue distributed to counties would be about \$16.7 million.

Total employment and income associated with the leasing, rent, and production of federal minerals by the BLM would be an estimated annual 2,530 jobs and \$148.0 million. The oil and gas industry would continue to be a major influence on the local economy; however the total demographic and economic characteristics of the local economy would change little with the economic activity associated with leasing the additional acres of federal minerals.

Industry	Total Jobs Contributed			Total Income Contributed (\$1000)		
	Alt. A	Alt. B	Alt. C	Alt. A	Alt. B	Alt. C
Agriculture	2	2	2	\$153	\$158	\$157
Mining	855	885	879	\$71,640	\$74,165	\$73,677
Utilities	15	15	15	\$1,633	\$1,688	\$1,677
Construction	19	20	20	\$939	\$964	\$959
Manufacturing	8	8	8	\$390	\$404	\$401
Wholesale Trade	224	232	231	\$14,172	\$14,668	\$14,572
Transportation & Warehousing	146	151	150	\$10,273	\$10,631	\$10,562
Retail Trade	147	152	151	\$3,708	\$3,835	\$3,811
Information	33	34	34	\$1,762	\$1,821	\$1,809
Finance & Insurance	141	145	144	\$4,364	\$4,513	\$4,484
Real Estate & Rental & Leasing	71	73	73	\$4,329	\$4,480	\$4,451
Prof, Scientific, & Tech Services	194	201	199	\$10,283	\$10,641	\$10,572
Mngt of Companies	24	25	25	\$1,728	\$1,789	\$1,778
Admin, Waste Mngt & Rem Serv	70	73	72	\$1,598	\$1,652	\$1,641
Educational Services	11	12	12	\$143	\$148	\$147
Health Care & Social	120	124	123	\$5,109	\$5,283	\$5,249

Assistance						
Arts, Entertainment, and Rec	19	20	20	\$277	\$287	\$285
Accommodation & Food Services	100	103	102	\$1,547	\$1,599	\$1,589
Other Services	100	104	103	\$2,782	\$2,875	\$2,857
Government	149	152	152	\$6,329	\$6,448	\$6,423
Total Federal Contribution	2,449	2,532	2,516	\$143,162	\$148,048	\$147,100
Percent Change from Current	0.0%	3.4%	2.7%	0.0%	3.4%	2.8%

4.16.3 Employment and Income by Major Industry by Alternative

Source: IMPLAN, 2009

Alternative C

The cumulative effects of federal mineral leasing within the local economy as well as the specific effects of leasing an additional 5,908 acres are presented in the previous analysis. These effects are summarized in Tables 4.16.1, 4.16.2, and 4.16.3.

Total annual federal revenues related to leasing 213,564 acres of federal minerals and associated annual rent and royalty revenues related to annual production of federal minerals would amount to an estimated \$54.2 million. This would be an estimated annual increase of \$635,000 compared to current management and Alternative A. Total annual revenues distributed to the state and counties would increase by about \$259,000 and \$182,000 respectively, over current management and Alternative A. Total estimated annual revenue distributed to counties would be about \$16.6 million.

Total employment and income associated with the leasing, rent, and production of federal minerals by the BLM would be an estimated annual 2,520 jobs and \$147.1 million. The oil and gas industry would continue to be a major influence on the local economy; however the total demographic and economic characteristics of the local economy would change little with the economic activity associated with leasing the additional acres of federal minerals.

5.0 CONSULTATION AND COORDINATION:

5.1 Persons, Agencies, and Organizations Consulted

Table 5.1.1 lists persons, agencies, and organizations that were consulted or coordinated with during development of this EA along with the findings and conclusions associated with consultations.

Table 5.1.1. List of individuals, agencies and organizations consulted or coordinated with regarding on this EA

Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions
U.S. Army Corps of Engineers	COE Surface – SME	Stipulation Recommendations
U.S. Fish and Wildlife Service	T&E Species	Addressed with 2006 “backlog” consultation and 1988 (RMP) Section 7 consultation. Further comments to be addressed during comment period.
North Dakota Game and Fish Department	Resident species and habitats	To be addressed during comment period No comments were received
Tribal Historic Preservation Officer, and Review and Compliance Officer for the Mandan, Hidatsa, and Arikara Nation	National Historic Preservation Act, Section 106 Reference (36 CFR 800)	Pending Review and Comment No comments were received
Tribal Historic Preservation Officer from the Turtle Mountain Band of Chippewa Indians	National Historic Preservation Act, Section 106 Reference (36 CFR 800)	Pending Review and Comment No comments were received
Tribal Historic Preservation Officer from the Standing Rock Sioux Tribe	National Historic Preservation Act, Section 106 Reference (36 CFR 800)	Pending Review and Comment No comments were received
Tribal Chair Person Spirit Lake Sioux	National Historic Preservation Act, Section 106 Reference (36 CFR 800)	Pending Review and Comment No comments were received
Northern Cheyenne Tribe	National Historic Preservation Act, Section 106 Reference (36 CFR 800)	Pending Review and Comment, Received scoping response asking to be kept informed as a consulting party. No further comments were received.
Fort Peck Tribes (Assiniboine & Sioux)	National Historic Preservation Act, Section 106 Reference (36 CFR 800)	Pending Review and Comment No comments were received

5.2 Summary of Public Participation

Scoping

Public scoping for this proposed leasing project was conducted through a 15-day scoping period advertised on the BLM Montana State Office website and posting on the NDFO website NEPA notification log. The NEPA log was updated on June 20, 2011, and the preliminary stipulations list was posted on July 5, 2011. The 15-day scoping period began on July 5, 2011, but comments were accepted until August 19, 2011. Surface owner notification letters were also distributed briefly explaining the oil and gas leasing process and planning process. The surface owner notification letter requested written comments regarding any issues or concerns that should be addressed in the environmental analysis. A total of 32 surface owner notification letters were distributed for the oil and gas leasing analysis process for the NDFO.

The BLM did not receive written comments or phone comments, regarding the EA, during scoping.

No comments were received during the 30-day comment period.

Upon further internal review of the Appendix A, COE stipulations were added to a parcel that did not require said stipulations. Therefore, deletions shown by strikethrough, the Appendix A has been changed to show stipulations appropriately. The acquisition by the COE for these lands was for flowage easement purposes only. In addition the EA has been updated in the alternatives section to reflect the acreages of other federal agencies. These changes are also shown in strikethrough and the new acreages are shown in highlight.

Tribal consultation is outlined above in table 5.1.1. Updates are shown in strikethrough and highlight.

Table 5.1.2. List of Preparers

Name	Title	Responsible for the Following Section(s) of this Document
Brenda Shierts	Cultural Resources Specialist	Cultural Resources, Native American Religious Concerns, and Paleontology
Derek Enderud	Natural Resources Specialist	Soil, Water, Solid Minerals, and Fluid Minerals
David Hodgson	Natural Resources Specialist	Vegetation, Visual Resources, Range, Recreation and Travel Management, Noxious Weeds, and EA Lead
Tim Zachmeier	Wildlife Biologist	Fish & Wildlife, Special Status Animal and Plant Species
Linda Gisvold	Realty Specialist	Lands & Realty
John Thompson	Planning & Environmental	Economic Conditions

	Specialist	
Joan Trent	Sociologist	Social Conditions

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APPENDIX A

PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING ALTERNATIVE C	PROPOSED FOR DEFERRAL/NO LEASING ALTERNATIVE C
NDM 97300-MV	T.158 N, R. 82 W, 5TH PM, ND SEC. 4 LOTS 3,4; SEC. 4 S2NW; RENVILLE COUNTY 160.48 AC 50% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 97300-IR	T. 159 N, R. 83 W, 5TH PM, ND SEC. 20 E2E2; BOTTINEAU COUNTY 160.00 AC 50% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 97300-C2	T. 160 N, R. 84 W, 5TH PM, ND SEC. 23 SE; SEC. 24 SW; SEC. 26 NE; RENVILLE COUNTY 480.00 AC 50% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) NSO 11-33(ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) NSO 11-33(ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 79010-AS	T. 156 N, R. 90 W, 5TH PM, ND SEC. 4 POR SWSW INCL IN FWS BDY; MOUNTRAIL COUNTY 50% U.S. MINERAL INTEREST 30.00 AC ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) NSO 11-33(ALL LANDS) NSO 11-59(ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) NSO 11-33(ALL LANDS) NSO 11-59(ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None

APPENDIX A

PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING ALTERNATIVE C	PROPOSED FOR DEFERRAL/NO LEASING ALTERNATIVE C
NDM 79010-AN	T. 156 N, R. 91 W, 5TH PM, ND SEC. 13 W2NE; MOUNTRAIL COUNTY 80.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-33(ALL LANDS) NSO 11-59(ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-33(ALL LANDS) NSO 11-59(ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 97300-12	T. 161 N, R. 92 W, 5TH PM, ND SEC. 12 NE; BURKE COUNTY 160.00 AC 50% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 97300-GS	T. 144 N, R. 94 W, 5TH PM, ND SEC. 6 LOTS 1,2; SEC. 6 S2NE; DUNN COUNTY 160.71 AC ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-33(ALL LANDS) NSO 11-59(ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-33(ALL LANDS) NSO 11-59(ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None

APPENDIX A

PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING ALTERNATIVE C	PROPOSED FOR DEFERRAL/NO LEASING ALTERNATIVE C
NDM 79010-MR	T. 148 N, R. 95 W, 5TH PM, ND SEC. 30 FORMER LTL MO RVRBD RIPAR TO LOT 5 DESC BY M&B (3.96 AC); SEC. 31 FORMER LTL MO RVRBD RIPAR TO LOTS 1,2,5,6, 7,8 DESC BY M&B (46.90 AC); SEC. 32 FORMER LTL MO RVRBD RIPAR TO LOTS 4,5,11 DESC BY M&B (13.66 AC); DUNN COUNTY 64.52 AC PD	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS) COE 18-1 (ALL COE LANDS) COE 18-2 (ALL COE LANDS) COE 18-7 (ALL COE LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS) COE 18-1 (ALL COE LANDS) COE 18-2 (ALL COE LANDS) COE 18-7 (ALL COE LANDS)	None
NDM 97300-KD	T. 137 N, R. 96 W, 5TH PM, ND SEC. 6 LOTS 1,2,3,4; STARK COUNTY 50% U.S. MINERAL INTEREST 143.15 AC ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 97300-JQ	T. 158 N, R. 97 W, 5TH PM, ND SEC. 25 N2; WILLIAMS COUNTY 320.00 AC 50% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None

APPENDIX A

PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING ALTERNATIVE C	PROPOSED FOR DEFERRAL/NO LEASING ALTERNATIVE C
NDM 97300-KP	T. 136 N, R. 98 W, 5TH PM, ND SEC. 24 W2E2; SEC. 25 LOTS 1,2,3,4; SEC. 25 W2E2; SLOPE COUNTY 453.68 AC 50% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 97300-KQ	T. 136 N, R. 98 W, 5TH PM, ND SEC. 29 ALL; SLOPE COUNTY 640.00 AC 50% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 97300-KM	T. 138 N, R. 98 W, 5TH PM, ND SEC. 28 N2NW; STARK COUNTY 80.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-17 (ALL LANDS) NSO 11-38 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS) TL 13-5 (ALL LANDS) TL 13-24 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-17 (ALL LANDS) NSO 11-38 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS) TL 13-5 (ALL LANDS) TL 13-24 (ALL LANDS)	None

APPENDIX A

PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING ALTERNATIVE C	PROPOSED FOR DEFERRAL/NO LEASING ALTERNATIVE C
NDM 97300-KN	T. 138 N, R. 98 W, 5TH PM, ND SEC. 33 N2; STARK COUNTY 320.00 AC 50% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 97300-IS	T. 150 N, R. 98 W, 5TH PM, ND SEC. 31 LOT 4; MCKENZIE COUNTY 38.71 AC 50% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 97300-I9	T. 152 N, R. 99 W, 5TH PM, ND SEC. 8 NWNW; MCKENZIE COUNTY 40.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 97300-ID	T. 153 N, R. 100 W, 5TH PM, ND SEC. 30 NWSE; MCKENZIE COUNTY 40.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-38 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-24 (ALL LANDS) COE 18-1 (ALL COE LANDS) COE 18-2 (ALL COE LANDS) COE 18-7 (ALL COE LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-38 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-24 (ALL LANDS) COE 18-1 (ALL COE LANDS) COE 18-2 (ALL COE LANDS) COE 18-7 (ALL COE LANDS)	None

APPENDIX A

PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING ALTERNATIVE C	PROPOSED FOR DEFERRAL/NO LEASING ALTERNATIVE C
NDM 97300-IE	T. 153 N, R. 100 W, 5TH PM, ND SEC. 32 NESW; MCKENZIE COUNTY 40.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16-2 (ALL LANDS) COE 18-1 (ALL COE LANDS) COE 18-2 (ALL COE LANDS) COE 18-7 (ALL COE LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16-2 (ALL LANDS) COE 18-1 (ALL COE LANDS) COE 18-2 (ALL COE LANDS) COE 18-7 (ALL COE LANDS)	None
NDM 97300-JR	T. 163 N, R. 100 W, 5TH PM, ND SEC. 12 NW; DIVIDE COUNTY 160.00 AC 50% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) NSO 11-33 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) NSO 11-33 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None

APPENDIX A

PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING ALTERNATIVE C	PROPOSED FOR DEFERRAL/NO LEASING ALTERNATIVE C
NDM 97300-IC	T. 153 N, R. 101 W, 5TH PM, ND SEC. 4 POR OF TR KK3336 DESC BY M&B (6.49 AC); SEC. 5 POR OF TR KK3336 DESC BY M&B (4.09 AC); SEC. 6 POR OF TR KK3336 DESC BY M&B (0.98 AC); SEC. 7 POR OF TR KK3336 DESC BY M&B (0.65 AC); SEC. 8 POR OF TR KK3336 DESC BY M&B (2.22 AC); SEC. 9 POR OF TR KK3336 DESC BY M&B (2.90 AC); MCKENZIE COUNTY 17.33 AC ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) NSO 11-39 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS) COE 18-1 (ALL COE LANDS) COE 18-2 (ALL COE LANDS) COE 18-7 (ALL COE LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) NSO 11-39 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS) COE 18-1 (ALL COE LANDS) COE 18-2 (ALL COE LANDS) COE 18-7 (ALL COE LANDS)	None
NDM 97300-JU	T. 162 N, R. 101 W, 5TH PM, ND SEC. 12 NW,SE; DIVIDE COUNTY 320.00 AC 50% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None

APPENDIX A

PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING ALTERNATIVE C	PROPOSED FOR DEFERRAL/NO LEASING ALTERNATIVE C
NDM 97300-I8	T. 162 N, R. 101 W, 5TH PM, ND SEC. 31 LOTS 2,3,4; SEC. 31 SENW; DIVIDE COUNTY 157.15 AC 50% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) NSO 11-33 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) NSO 11-33 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 97300-JT	T. 163 N, R. 101 W, 5TH PM, ND SEC. 29 NE; DIVIDE COUNTY 160.00 AC 50% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 97300-KL	T. 152 N, R. 102 W, 5TH PM, ND SEC. 21 LOT 5; MCKENZIE COUNTY 1.01 AC PD	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 97300-JV	T. 162 N, R. 102 W, 5TH PM, ND SEC. 8 SWNW,N2SW; SEC. 17 NENW; DIVIDE COUNTY 160.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) NSO 11-33(ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) NSO 11-33(ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None

APPENDIX A

PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING ALTERNATIVE C	PROPOSED FOR DEFERRAL/NO LEASING ALTERNATIVE C
NDM 97300-IO	T. 162 N, R. 102 W, 5TH PM, ND SEC. 25 NWNE,S2NE; DIVIDE COUNTY 120.00 AC 50% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-33(ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-33(ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 97300-JW	T. 162 N, R. 102 W, 5TH PM, ND SEC. 33 SE; DIVIDE COUNTY 160.00 AC 50% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-13 (ALL LANDS) NSO 11-33 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-13 (ALL LANDS) NSO 11-33 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 97300-IX	T. 142 N, R. 103 W, 5TH PM, ND SEC. 2 LOTS 1,2,3,4; SEC. 2 S2N2,S2; GOLDEN VALLEY COUNTY 642.08 AC PD	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 97300-KK	T. 153 N, R. 103 W, 5TH PM, ND SEC. 5 LOTS 3,4; SEC. 5 S2NW,SW; WILLIAMS COUNTY 319.36 AC 50% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None

APPENDIX A

PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING ALTERNATIVE C	PROPOSED FOR DEFERRAL/NO LEASING ALTERNATIVE C
NDM 97300-IY	T. 153 N, R. 103 W, 5TH PM, ND SEC. 6 SE; WILLIAMS COUNTY 160.00 AC 50% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS)	None
NDM 97300-IZ	T. 153 N, R. 103 W, 5TH PM, ND SEC. 26 SWNW,NESW; WILLIAMS COUNTY 80.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-38 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS) TL 13-24 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-38 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS) TL 13-24 (ALL LANDS)	None
NDM 97300-II	T. 153 N, R. 103 W, 5TH PM, ND SEC. 27 NESW; WILLIAMS COUNTY 40.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-38 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS) TL 13-24 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-38 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS) TL 13-24 (ALL LANDS)	None
NDM 97300-EN	T. 130 N, R. 106 W, 5TH PM, ND SEC. 25 SWNE,N2NW,SENW, W2SE,SESE; BOWMAN COUNTY 280.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) CSU 12-16 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS) TL 13-17 (ALL LANDS)	DEFER (ALL LANDS)	ALL LANDS- Sage Grouse

APPENDIX A

PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING ALTERNATIVE C	PROPOSED FOR DEFERRAL/NO LEASING ALTERNATIVE C
NDM 97300-EK	T. 131 N, R. 107 W, 5TH PM, ND SEC. 2 LOTS 3,4; SEC. 2 S2NW,S2; BOWMAN COUNTY 479.90 AC PD	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-35 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS) TL 13-17 (ALL LANDS)	DEFER (ALL LANDS)	ALL LANDS- Sage Grouse
NDM 97300-EH	T. 132 N, R. 107 W, 5TH PM, ND SEC. 26 NENE,SW,S2SE; SEC. 34 LOTS 1,2,3,4; SEC. 34 E2E2; BOWMAN COUNTY 646.24 AC PD	CR 16-1 (ALL LANDS) CSU 12-5 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) STANDARD 16-3 (ALL LANDS) TES 16- 2 (ALL LANDS) TL 13-17 (ALL LANDS)	DEFER (ALL LANDS)	ALL LANDS- Sage Grouse

APPENDIX B- Stipulations Key

Stipulation Number	Stipulation Name/Brief Description
CSU 12-5	CONTROLLED SURFACE USE STIPULATION
	Surface occupancy or use would be subject to the following special operating constraint: No disturbance of Riparian areas of wetlands, intermittent, ephemeral, or perennial streams and rivers would be allowed except for essential road and utility crossings.
Cultural Resources 16-1	CULTURAL RESOURCES LEASE STIPULATION
	This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities.
Lease Notice 14-12	LEASE NOTICE
	Paleontological resource inventory requirement: surface occupancy or use is subject to the following special operating constraints: the lessee/operator is given notice that this lease has been identified as being located within geologic units rated as being moderate to very high potential for containing significant paleontological resources. The locations identified meet the conditions 1 and/or 2 as set forth in the potential fossil yield classification system, IM 2008-009, Attachment 2-2. The BLM is responsible for assuring that the leased lands are examined to determine if paleontological resources are present and to specify mitigation measures. Guidance for application of this requirement can be found in IM 2008-009, 10/15/2007 and IM 2009-011, 10/10/2008. The project proponent may be required to conduct a paleontological inventory prior to any surface disturbance. If inventory is required, the project proponent must engage the services of a qualified paleontologist, acceptable to the BLM, to conduct the inventory. An acceptable inventory report is to be submitted to the BLM for review and approval at the time a surface-disturbing plan of operations is submitted. Prior to undertaking any surface-disturbing activities on the lands covered by this lease, the lessee or project proponent shall contact the BLM to determine if a paleontological resource inventory is required. if an inventory is required then;
	1.) The lessee or project proponent will complete the required inventory. The lessee or project proponent may engage the services of a paleontological resource consultant acceptable to the BLM to conduct a paleontological resource inventory of the area of proposed surface disturbance. The project proponent will, at a minimum, inventory a 10-acre area or larger to incorporate possible project relocation which may result from environmental or other resource considerations.

	2.) Paleontological inventory may identify resources that may require mitigation to the satisfaction of the BLM as directed by IM 2009-011, 10/10/2008.
Lease Notice 14-13	LEASE NOTICE
	The lease parcel is encumbered with a US Fish and Wildlife Wetland and/or Grassland Easement to restrict draining, burning, filling, or leveling of wetlands and/or protection of native prairies depending on the specific easement. The operator may be required to implement specific measures to reduce the impacts of oil and gas operations on wetlands or native prairies the easement protects. Additional measures may be developed during the application for permit to drill on-site inspection as well as the environmental review process, consistent with the lease rights granted and in accordance with 43 CFR 3101.1-2.
Lease Notice 14-15	LEASE NOTICE
	The lease area may contain habitat for the federal candidate Sprague's pipit. The operator may be required to implement specific measures to reduce impacts of oil and gas operations on Sprague's pipits, their habitat, and overall population. Such measures would be developed during the application for permit to drill and environmental review processes, consistent with lease rights. If the USFWS lists the Sprague's pipit as threatened or endangered under ESA, BLM would enter into formal consultation on proposed permits that may affect the Sprague's pipit and its habitat. Restrictions, modifications, or denial of permits could result from the consultation process.
NSO 11-17	NO SURFACE OCCUPANCY STIPULATION
	Surface occupancy and use is prohibited within one-half mile of Ferruginous Hawk nest sites.
NSO 11-33	NO SURFACE OCCUPANCY STIPULATION
	No surface occupancy (NSO) or use would be allowed within 200 feet of wetlands, lakes, and ponds.
NSO 11-35	NO SURFACE OCCUPANCY STIPULATION
	No surface occupancy (NSO) would be allowed within one-fourth mile of active Sage Grouse strutting grounds.
NSO 11-38	NO SURFACE OCCUPANCY STIPULATION
	No surface occupancy (NSO) or use would be allowed within one-half mile of Golden Eagle nests known to have been occupied at least once within the seven previous years.
NSO 11-39	NO SURFACE OCCUPANCY STIPULATION
	No surface occupancy (NSO) of those lands within the floodplain of the Missouri River.
NSO 11-59	NO SURFACE OCCUPANCY STIPULATION

	Surface occupancy and use is prohibited on lands administered by the U.S. Fish and Wildlife Service (FWS).
Standard 16-3	STANDARD LEASE STIPULATION
TES 16-2	ENDANGERED SPECIES ACT SECTION 7 CONSULTATION STIPULATION
	The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development, and require modifications to or disapprove proposed activity that is likely to result in jeopardy to proposed or listed threatened or endangered species or designated or proposed critical habitat.
TL 13-5	TIMING LIMITATION STIPULATION
	No surface use would be allowed within one-half mile of occupied Ferruginous Hawk nests known to be occupied at least once within the seven previous years during the following time period: March 15 to July 15.
TL 13-17	TIMING LIMITATION STIPULATION
	No surface use would be allowed within two miles of active strutting grounds during the following time period: March 1 to June 15.
TL13-24	TIMING LIMITATION STIPULATION
	Surface use is prohibited within one-half mile of occupied Golden Eagle nests known to be occupied at least once within the seven previous years during the following time period: February 15 to July 15.
COE 18-1	CORPS OF ENGINEERS - Agency Lease Stipulation
COE 18-2	CORPS OF ENGINEERS - Agency Lease Stipulation
COE 18-7	CORPS OF ENGINEERS - Agency Lease Stipulation

UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Land Management
5001 Southgate Drive
Billings, Montana 59101-4669

OIL AND GAS LEASE STIPULATIONS

ESTHETICS--To maintain esthetic values, all surface-disturbing activities, semipermanent and permanent facilities may require special design including location, painting and camouflage to blend with the natural surroundings and meet the intent of the visual quality objectives of the Federal Surface Managing Agency (SMA).

EROSION CONTROL--Surface-disturbing activities may be prohibited during muddy and/or wet soil periods.

CONTROLLED OR LIMITED SURFACE USE STIPULATION --This stipulation may be modified, consistent with land use documents, when specifically approved in writing by the Bureau of Land Management (BLM) with concurrence of the SMA. Distances and/or time periods may be made less restrictive depending on the actual on-ground conditions. The prospective lessee should contact the SMA for more specific locations and information regarding the restrictive nature of this stipulation.

The lessee/operator is given notice that the lands within this lease may include special areas and that such areas may contain special values, may be needed for special purposes, or may require special attention to prevent damage to surface and/or other resources. Possible special areas are identified below. Any surface use or occupancy within such special areas will be strictly controlled, or **if absolutely necessary**, excluded. Use or occupancy will be restricted only when the BLM and/or the SMA demonstrates the restriction necessary for the protection of such special areas and existing or planned uses. Appropriate modifications to imposed restrictions will be made for the maintenance and operations of producing oil and gas wells.

After the SMA has been advised of specific proposed surface use or occupancy on the leased lands, and on request of the lessee/operator, the Agency will furnish further data on any special areas which may include:

100 feet from the edge of the rights-of-way from highways, designated county roads and appropriate federally-owned or controlled roads and recreation trails.

500 feet, or when necessary, within the 25-year flood plain from reservoirs, lakes, and ponds and intermittent, ephemeral or small perennial streams: 1,000 feet, or when necessary, within the 100-year flood plain from larger perennial streams, rivers, and domestic water supplies.

500 feet from grouse strutting grounds. Special care to avoid nesting areas associated with strutting grounds will be necessary during the period from March 1, to June 30. One-fourth mile from identified essential habitat of state and federal sensitive species. Crucial wildlife winter ranges during the period from December 1 to May 15, and in elk calving areas during the period from May 1 to June 30.

300 feet from occupied buildings, developed recreational areas, undeveloped recreational areas receiving concentrated public use and sites eligible for or designated as National Register sites.

Seasonal road closures, roads for special uses, specified roads during heavy traffic periods and on areas having restrictive off-road vehicle designations.

On slopes over 30 percent or 20 percent on extremely erodable or slumping soils.

See Notice on Back

NOTICE

APPLICATIONS FOR PERMIT TO DRILL (APDs)--The appropriate BLM field offices are responsible for the receipt, processing, and approval of APDs. The APDs are to be submitted by oil and gas operators pursuant to the requirements found in Onshore Oil and Gas Order No. 1 -- Approval of Operations on Onshore Federal and Indian Oil and Gas Leases (Circular No. 2538). Additional requirements for the conduct of oil and gas operations can be found in the Code of Federal Regulations Title 43, Part 3160. Copies of Onshore Oil and Gas Order No. 1, and pertinent regulations, can be obtained from the BLM field offices in which the operations are proposed. Early coordination with these offices on proposals is encouraged.

CULTURAL AND PALEONTOLOGICAL RESOURCES--The SMA is responsible for assuring that the leased lands are examined to determine if cultural resources are present and to specify mitigation measures. Prior to undertaking any surface-disturbing activities on the lands covered by this lease, the lessee or operator, unless notified to the contrary by the SMA, shall:

1. Contact the appropriate SMA to determine if a site-specific cultural resource inventory is required. If an inventory is required, then:
2. Engage the services of a cultural resource specialist acceptable to the SMA to conduct a cultural resource inventory of the area of proposed surface disturbance. The operator may elect to inventory an area larger than the area of proposed disturbance to cover possible site relocation which may result from environmental or other considerations. An acceptable inventory report is to be submitted to the SMA for review and approval no later than that time when an otherwise complete application for approval of drilling or subsequent surface-disturbing operation is submitted.
3. Implement mitigation measures required by the SMA. Mitigation may include the relocation of proposed lease-related activities or other protective measures such as testing salvage and recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the SMA, surface occupancy on that area must be prohibited.

The operator shall immediately bring to the attention of the SMA any cultural or paleontological resources discovered as a result of approved operations under this lease, and not disturb such discoveries until directed to proceed by the SMA.

ENDANGERED OR THREATENED SPECIES--The SMA is responsible for assuring that the leased land is examined prior to undertaking any surface-disturbing activities to determine effects upon any plant or animal species, listed or proposed for listing as endangered or threatened, or their habitats. The findings of this examination may result in some restrictions to the operator's plans or even disallow use and occupancy that would be in violation of the Endangered Species Act of 1973 by detrimentally affecting endangered or threatened species or their habitats. The lessee/operator may, unless notified by the authorized officer of the SMA that the examination is not necessary, conduct the examination on the leased lands at his discretion and cost. This examination must be done by or under the supervision of a qualified resources specialist approved by the SMA. An acceptable report must be provided to the SMA identifying the anticipated effects of a proposed action on endangered or threatened species or their habitats.

Standard 16-3