



In Reply Refer To:

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Miles City Field Office
111 Garryowen Road
Miles City, Montana 59301-7000
www.blm.gov/mt



December 3, 2012

Dear Reader:

The Bureau of Land Management (BLM) Miles City Field Office has prepared an environmental assessment (EA) to analyze the potential effects from offering 49 nominated lease parcels for competitive oil and gas leasing in a sale tentatively scheduled to occur on May 8, 2013.

The EA with an unsigned Finding of No Significant Impact (FONSI) is available for a 30-day public comment period. Written comments must be postmarked by January, 1, 2013, to be considered. Comments may be submitted using one of the following methods:

Email: BLM_MT_Miles_CityFO_Lease_EA@blm.gov

Mail: Miles City Field Office
Attn: Irma Nansel
111 Garryowen Road
Miles City, Montana 59301-7000

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – will be available for public review. If you wish to withhold personal identifying information from public review or disclosure under the Freedom of Information Act (FOIA), you must clearly state, in the first line of your written comment, “CONFIDENTIALITY REQUESTED.” While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. All submissions from organizations, from businesses, and from individuals identifying themselves as representatives of organizations or businesses, will be available for public review.

Upon review and consideration of public comments, the EA will be updated as needed. Based on our analysis, parcels recommended for leasing in our assessment would be included as part of a competitive oil and gas lease sale tentatively scheduled to occur on May 8, 2013.

Prior to issuance of any leases, the Decision Record and FONSI will be finalized and posted for public review on our BLM website. Please refer to the Montana/Dakotas BLM website at

<http://blm.gov/57jd>. Current and updated information about our EAs, Lease Sale Notices, and corresponding information pertaining to this sale can be found at the link referenced above. Once there, locate the May 8, 2013 lease sale to review the MCFO EA and the parcel list with recommended stipulations.

If you have any questions or would like more information about lease sale notices or the issuance of the EA, Decision Record and FONSI, please contact me at 406-233-2837.

Sincerely,

A handwritten signature in black ink, appearing to read "Todd D. Yeager". The signature is written in a cursive style with a prominent horizontal line across the middle.

Todd D. Yeager
Field Manager

United States Department of the Interior
Bureau of Land Management

Environmental Assessment DOI-BLM-MT-C020-2013-4-EA
December 3, 2012

Project Title: Oil and Gas Lease Parcel, May 8, 2013 Sale

Location: Miles City Field Office (see Appendix A for list of lease parcels by number and legal description and Maps 1-12)



**Miles City Oil and Gas Lease Sale EA
DOI-BLM-MT-C020-2013-4-EA**

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Miles City Field Office Oil and Gas Lease Sale Parcel Reviews

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1.0 PURPOSE AND 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 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, 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. Federal mineral leases can be sold on such lands as well. The Montana State Office has historically conducted five lease sales per year.

Members of the public file Expressions of Interest (EOI) to nominate parcels for leasing by the BLM. From these EOIs, the Montana State Office 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 are nominated by private individuals, companies, or the BLM, and therefore represent areas of high interest.

This environmental assessment (EA) has been prepared to disclose and analyze the potential environmental consequences from leasing all 49 nominated lease parcels encompassing a total of 21,323.0373 surveyed federal mineral acres located in the Miles City Field Office (MCFO), to be included as part of a competitive oil and gas lease sale tentatively scheduled to occur in May 8, 2013.

The analysis area includes the 49 nominated parcels in Daniels, Prairie, McCone, Roosevelt, Richland, Rosebud, and Garfield counties (Map 1).

1.2 Purpose and Need for the Proposed Action

The purpose of offering parcels for competitive oil and gas leasing is to provide opportunities for private individuals or companies to explore for and develop federal oil and gas resources after receipt of necessary approvals and to sell the oil and gas in 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 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 is whether to sell oil and gas leases on the lease parcels identified, and, if so, identify stipulations that would be included with specific lease parcels at the time of lease sale.

1.3 Conformance with Land Use Plan(s)

This EA is tiered to the information and analysis and conforms to the decisions contained in the Big Dry Resource Management Plan (RMP/EIS) of April 1996 and the Powder River RMP/EIS of March 1985, as amended (1994 Oil and Gas RMP/EIS Amendment, 2003 Final Statewide Oil and Gas Environmental Impact Statement and proposed Amendment of the Powder River and Billings RMPs, and the 2008 Final Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Proposed Amendment of the Powder River and Billings RMPs). The Big Dry and Powder River RMPs are the governing land use plans for the MCFO. The lease parcels to potentially be offered for sale are within areas determined to be open to oil and gas leasing in the Big Dry and Powder River RMPs. An electronic copy of the Big Dry RMP/EIS and the Powder River RMP/EIS, as amended, can be located via the internet on the BLM home page, www.blm.gov/mt. On the home page, locate the heading titled “*Montana/Dakotas*,” then select “*What We Do*”, then click on the “*Planning*” link.

A more complete description of activities and impacts, related to oil and gas leasing, development, production, etc. can be found at pages 111 to 156 of the Big Dry RMP and pages 55 to 77 of the 1994 Oil and Gas Amendment of the Powder River RMP (for leasing decisions), and pages 4-1 to 4-310 of the 2008 Final Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Proposed Amendment of the Powder River and Billings RMPs (for development, production, etc).

Analysis of the 49 parcels is documented in this EA, and was conducted by MCFO resource specialists who relied on professional knowledge of the areas involved, review of current databases, file information, and some site visits to ensure that appropriate stipulations were recommended for a specific parcel. Analysis may have also identified the need to defer entire or partial parcels from leasing pending further environmental review.

At the time of this review it is unknown whether a particular parcel will be sold and a lease issued. It is unknown when, where, or if future well sites, roads, and facilities might be proposed. Assessment of potential activities and impacts was based on potential well densities discerned from the Reasonably Foreseeable Development (RFD) Scenario developed for this environmental assessment (Appendix C), which is based on information contained in the MCFO RFD developed in 2005 and revised in 2012; it is an unpublished report that is available by contacting the MCFO. The RFD contains projections of the number of possible oil and gas wells that could be drilled and produced in the MCFO area and used to analyze projected wells for the 49 nominated lease parcels. Detailed site-specific analysis and mitigation of activities associated with any particular lease would occur when a lease holder submits an application for permit to drill (APD). A more complete description of mitigation, BMPs, and conditions of

approval related to oil and gas lease activities can be found at pages 302-326 of the Big Dry RMP, pages 130-137 of the 1994 Oil and Gas Amendment of the Powder River RMP, pages 3-6 of the 2008 Record of Decision for the Final Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Proposed Amendment of the Powder River and Billings RMPs, Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development-The Gold Book, and online at http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices.html. Offering the parcels for sale and issuing leases 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 Montana State Office website and posted on the MCFO website National Environmental Policy Act (NEPA) notification log. Scoping was initiated October 9, 2012. Scoping comments pertained to split estate development, and specific recommendations for wildlife resources. Refer to Section 5.2 of this EA for a more complete summary of the scoping comments received.

The BLM coordinates with Montana Fish, Wildlife, and Parks (MFWP), and the United States Fish and Wildlife Service (USFWS) to manage wildlife habitat because BLM management decisions can affect wildlife populations which depend on the habitat. The BLM manages habitat on BLM lands, while MFWP is responsible for managing wildlife species populations. The USFWS also manages some wildlife populations but only those federal trust species managed under mandates such as the Endangered Species Act, Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act. Managing wildlife is factored into project planning at multiple scales and is to be implemented early in the planning process.

Coordination with MFWP was conducted for the 49 lease parcels being reviewed and in the completion of this EA in order to prepare the analysis, identify protective measures, and apply stipulations and lease notices associated with these parcels being analyzed. Recommendations by the USFWS applied in previous lease sale EAs were also applied to the 49 lease parcels being reviewed. A letter was sent to the USFWS and MFWP during the 15-day scoping and 30-day public comment periods requesting comments on the 49 parcels being reviewed.

The BLM consults with Native Americans under various statutes, regulations, and executive orders, including the American Indian Religious Freedom Act, the National Historic Preservation Act, the Native American Graves Protection and Repatriation Act, the National Environmental Policy Act, and Executive Order 13175-Consultation and Coordination with Indian Tribal Governments. BLM sent letters to tribes in Montana, North and South Dakota and Wyoming for the 15-day scoping period informing them of the potential for the 49 parcels to be leased and inviting them to submit issues and concerns BLM should consider in the environmental analysis. Letters were sent to the Tribal Presidents and the Tribal Historical Preservation Officer (THPO) or other cultural contacts for the Cheyenne River Sioux Tribe, Crow Tribe of Montana, Crow Creek Sioux Tribe, Eastern Shoshone Tribe, Ft. Peck Tribes, Lower Brule Sioux Tribe, the Mandan, Hidasta, and Arkira Nation, Northern Arapaho Nation, Northern Cheyenne Tribe, Oglala Sioux Tribe, Rosebud Sioux Tribe of Indians, Standing Rock Sioux Tribe, and Turtle Mountain Band of Chippewa. In addition to scoping letters, THPOs also received file search results from the preliminary review of parcels conducted by BLM. BLM sent a second letter

with a copy of the EA to the tribes informing them about the 30 day public comment period for the EA and solicit any information BLM should consider before making a decision whether to offer any or all of the nominated parcels for sale.

The BLM and nine Tribes (Northern Cheyenne, Cheyenne River Sioux, Rosebud Sioux, Oglala Sioux, Sisseton Wahpeton Oyate, Yankton Sioux, Mandan, Hidatsa, Arikara, and Santee Sioux of Nebraska) met during a two-day BLM Intertribal Workshop in Spearfish, South Dakota on October 17-18, 2012. Agenda items included discussion on the leasing process and the May 2013 sale being reviewed. No specific comments were submitted for the May 2013 lease sale.

Relevant issues were identified by MCFO specialists through a preliminary review process conducted prior to a 15-day public scoping period. Relevant issues include effects to preliminary priority sage grouse habitat being analyzed in the current MCFO RMP planning effort. No issues were identified by the public during the 15-day scoping period.

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 49 lease parcels, covering 21,323.0373 surveyed federal mineral acres (10,786.03 surveyed BLM administered surface, 189.1073 Bureau of Recreational Management (BOR) surface, and 10,347.90 surveyed private/state surface), from the competitive oil and gas lease sale (Maps 1-12). 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 49 lease parcels of federal minerals for oil and gas leasing, covering 21,323.0373 surveyed federal mineral acres (10,786.03 surveyed BLM administered surface, 189.1073 BOR surface, and 10,347.90 surveyed private/state surface), in conformance with the existing land use planning decisions. Parcel number, size, and detailed locations and associated stipulations are listed in Appendix A. Maps 1-12 indicate the detailed location of each parcel.

2.3 Alternative C -BLM Preferred

Under the BLM Preferred Alternative, 42 whole parcels of the 49 lease parcels, 18,443.0373 surveyed federal mineral acres (9,346.03 surveyed BLM administered surface, 189.1073 surveyed BOR surface, and 8,907.9 surveyed private/state surface) would be offered with RMP lease stipulations and/or lease notices as necessary (Appendix A) for competitive oil and gas lease sale and lease issuance.

A total of 7 lease parcels, in whole, 2,880.00 surveyed federal mineral acres (1,440.00 surveyed BLM administered surface and 1,440.00 surveyed private surface), would be deferred (Map 13). All 7 lease parcels have been found to contain sage-grouse Preliminary Priority Habitat (PPH) being analyzed in the current MCFO RMP effort; therefore, all 7 lease parcels, in whole, would be deferred at this time pending further review and analysis. This would provide for consideration of alternatives in the current MCFO RMP planning effort utilizing recent research and updated BLM policies.

2.4 Additional Considerations for Alternatives B and C

For the split-estate lease parcels, the BLM provided courtesy notification to private landowners that the federal oil and gas estate under their surface would be included in this lease sale. In the event of activity on such split estate lease 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.

The terms and conditions of the standard federal lease and federal regulations would apply to each parcel offered for sale in each of the two Alternatives. Stipulations shown in Appendix A

would be included with identified parcels offered for sale. Standard operating procedures for oil and gas operations on federal leases include measures to protect the environment and resources such as groundwater, air, wildlife, historical and prehistorical concerns, and others as mentioned in the Big Dry and Powder River RMPs at pages 9 to 40 and 302 to 330 of the Minerals Appendix (Big Dry) and 2-1 to 2-28 and the Minerals Appendix Min-36 to Min-42 (2008 Final Supplement to the Montana Statewide Oil and Gas EIS and Proposed Amendment of the Powder River and Billings RMPs). Conditions of Approval (COAs) would be attached to permits issued to explore and develop the parcels to address site-specific concerns or new information. Standard operating procedures, best management practices (BMPs), COAs, and lease stipulations can change over time to meet RMP objectives, resource needs or land use compatibility.

Federal oil and gas leases would be issued for a 10-year period and would remain valid for as long thereafter as oil or gas is produced in paying quantities, required payments are made and lease operations are conducted in compliance with regulations and approved permits. If a lessee fails to produce oil and gas by the end of the initial 10 year period, does not make annual rental payments, does not comply with the terms and conditions of the lease, or relinquishes the lease, ownership of the minerals leased would revert back to the federal government and the lease could be resold.

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

3.0 AFFECTED ENVIRONMENT

3.1 Introduction

This chapter describes the existing environment (i.e., the physical, biological, social, and economic values and resources) within the analysis area, which includes the 49 nominated parcels in Daniels, Prairie, McCone, Roosevelt, Richland, Rosebud, and Garfield counties (Map 1), that could be affected by implementation of the alternatives described in Chapter 2.

The existing environment is described by the different resources found throughout the counties listed above. Within each resource description, lease parcels containing the resource will be listed and analyzed further in Chapter 4. If the lease parcel does not contain the resource, then the lease parcel will be omitted from the description of that specific resource.

Unless otherwise stated, resource analysis in this chapter, and Chapter 4, will be described in approximate acres due to the scaling and precision parameters associated with the Geographic Information System (GIS), in addition to being referenced to a different land survey.

Most of the analysis area consists of open expanses characteristic of the Northern Great Plains. This area is largely comprised of herbaceous vegetation (e.g., grasses) with interspersed shrubs (e.g., sagebrush). Lands with greater moisture or slopes exhibit ponderosa pine, limber pine, limited Douglas fir, and juniper species. Some hardwood trees grow along riparian areas and are common along the Missouri, Yellowstone, and Powder Rivers. The analysis area experiences extreme weather variations on a yearly basis due to its semiarid continental climate. Most of the public lands are scattered throughout the analysis area. The public lands are rich in natural resources, such as wildlife and livestock forage, minerals, cultural resources, paleontological resources, recreation opportunities, and watershed values.

Only those aspects of the existing environment that are potentially impacted by this project are described in detail. The following aspects of the existing environment were determined to not be present or not potentially impacted by this project include: coal, locatable minerals, salable minerals, lands with wilderness characteristics, cave and karst resources, wild and scenic rivers; wilderness study areas (WSAs); Areas of Critical Environmental Concern (ACECs) and hazardous wastes or solids. These resources and resource uses will not be discussed further in this EA.

3.2 Air Resources

Air resources include air quality, air quality related values (AQRVs), and climate change. As part of the planning and decision making process, BLM considers and analyzes the potential effects of BLM and BLM-authorized activities on air resources.

The Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality, including seven criteria air pollutants subject to National Ambient Air Quality Standards (NAAQS). Pollutants regulated under NAAQS include carbon monoxide (CO), lead, nitrogen dioxide (NO₂), ozone, particulate matter with a diameter less than or equal to 10 microns (PM₁₀), particulate matter with a diameter less than or equal to 2.5 microns (PM_{2.5}), and sulfur dioxide (SO₂). Two additional pollutants, nitrogen oxides (NO_x) and volatile organic compounds

(VOCs) are regulated because they form ozone in the atmosphere. Regulation of air quality is also delegated to some states. Air quality is determined by pollutant emissions and emission characteristics, atmospheric chemistry, dispersion meteorology, and terrain. AQRVs include effects on soil and water, such as sulfur and nitrogen deposition and lake acidification, and aesthetic effects, such as visibility.

Climate is the composite of generally prevailing weather conditions of a particular region throughout the year, averaged over a series of years. Climate change includes both historic and predicted climate shifts that are beyond normal weather variations.

3.2.1 Air Quality

The EPA air quality index (AQI) is an index used for reporting daily air quality (<http://www.epa.gov/oar/data/geosel.html>) to the public. The index tells how clean or polluted an area's air is and whether associated health effects might be a concern. The EPA calculates the AQI for five 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 NAAQS to protect public health. An AQI value of 100 generally corresponds to the primary NAAQS for the pollutant. 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.
- **Unhealthy** – The AQI is between 151 and 200. Everyone may begin to experience some adverse health effects, and members of the sensitive groups may experience more serious effects.
- **Very Unhealthy** – The AQI is between 201 and 300. This index level would trigger a health alert signifying that everyone may experience more serious health effects.

AQI data show that there is little risk to the general public from air quality in the analysis area (Table 1). Based on available aggregate data for Richland County (the nearest county with monitoring data) for years 2009–2011, 93 percent of the days were rated “good” and the three-year median daily AQI was 32 for monitors in the analysis area.

Table 1. US EPA – Air Data Air Quality Index Report (2009-2011)

County ¹	# Days in Period	# Days Rated Good or No Data	Percent of Days Rated Good or No Data	# Days Rated Moderate	# Days Rated Unhealthy for Sensitive Groups	# Days Rated Unhealthy	# Days Rated Very Unhealthy
Richland	1,095	1,024	93%	71	0	0	0

¹The Richland County monitor is located near Sidney, MT. Source: EPA Air Data website (http://www.epa.gov/airdata/ad_rep_aqi.html, accessed March 28, 2012).

The area managed by the MCFO is in compliance with all NAAQS. Based on monitoring data available for 2009 through 2011, maximum concentrations as a percentage of the NAAQS are summarized in Table 2. Data are not provided for CO and lead which are not monitored within the analysis area.

Table 2. Monitored Concentrations Representative of the Study Area ^a

Pollutant	Averaging Time	Applicable Standard ^b	Concentration ^{c, d}
NO ₂	1 hour	100 ppb	9 ppb (9%)
	Annual	50 ppb	1.85 ppb (4%)
O ₃	8 hour	0.075 ppm	0.056 ppm (75%)
PM ₁₀	24 hour	150 µg/m ³	96 µg/m ³ (64%)
	Annual	50 µg/m ³	21 µg/m ³ (42%)
PM _{2.5}	24 hour	35 µg/m ³	14 µg/m ³ (40%)
	Annual	15 µg/m ³	6 µg/m ³ (40%)
SO ₂	1 hour	75 ppb	0.058 ppm (77%) ^e
	3 hour	---	---

- ^a Representative concentrations are based on data from the Sidney monitoring station in Richland County.
- ^b Most restrictive national or state standard.
- ^c Monitored concentrations are the 2nd highest for 24-hour PM₁₀; three-year average of the annual 4th highest daily maximum for 8-hour O₃; three-year average of the 98th percentile for 24-hour PM_{2.5} and 1-hour NO₂; and arithmetic mean for annual NO₂ and PM_{2.5}.
- ^d Values in parentheses are monitored concentrations as a percentage of the most restrictive applicable standard.
- ^e Only two years of recent data were available for SO₂. The two-year average is based on calendar years 2010 and 2011.
- Source: EPA Air Data website (http://www.epa.gov/airdata/ad_rep_con.html, accessed March 28, 2012).

Air resources also include visibility, which can be degraded by regional haze due in part to sulfur, nitrogen, and particulate emissions. Based on trends identified during 2005-2009, visibility has degraded slightly at the Medicine Lake National Wildlife Refuge IMPROVE monitor in Sheridan County on the haziest days (20 percent worse days). On the 20 percent best

(clearest) days, visibility at this monitor has been improving, as shown by decreasing haze in Figure A.

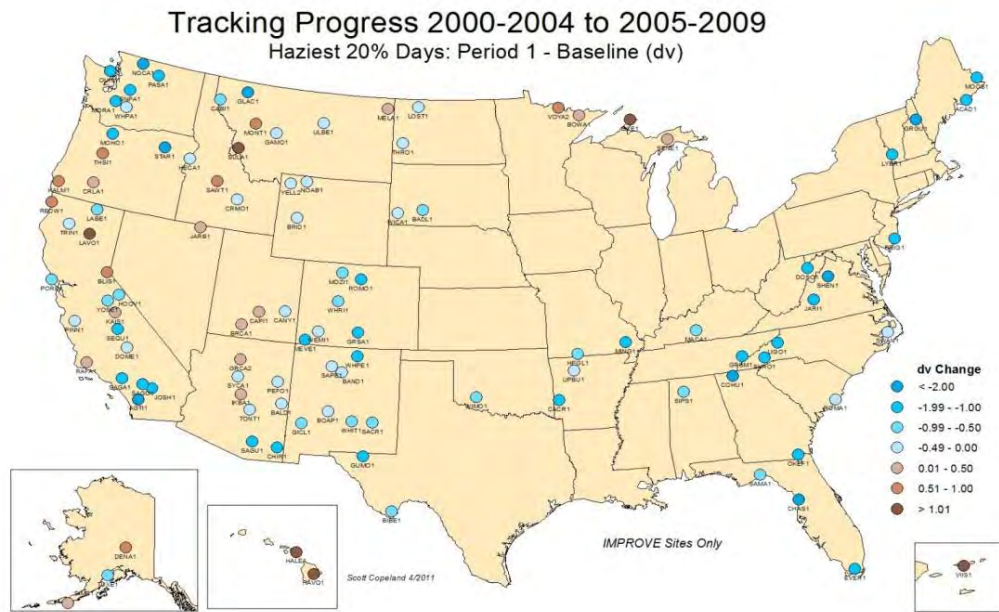


Figure A. Trends in haze index (deciview) on haziest and clearest days, 2005-2009.
 Source: IMPROVE 2011.

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 2007). Climate change and climate science are discussed in detail in the climate change Supplementary Information Report 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 (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 the IPCC (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 the climate change SIR, earth has a natural greenhouse effect wherein naturally occurring gases such as water vapor, CO₂, methane, and 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 caused, in part, by 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 (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 CO₂ and methane) from fossil fuel development, large wildfires, activities using combustion engines, changes to the natural carbon cycle, and changes to radiative forces and reflectivity (albedo). It is important to note that GHGs will have a sustained climatic impact over different temporal scales due to their differences in global warming potential (described above) and lifespans in the atmosphere. 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).

With regard to statewide GHG emissions, Montana ranks in the lowest decile when compared to all the states (http://assets.opencrs.com/rpts/RL34272_20071205.pdf, Ramseur 2007). The estimate of Montana's 2005 GHG emissions of 37 million metric tons (MMt) of gross consumption-based carbon dioxide equivalent (CO₂e) account for approximately 0.6 percent of the U.S. GHG emissions (CCS 2007).

Some information and projections of impacts beyond the project scale are becoming increasingly available. Chapter 3 of the climate change SIR describes impacts of climate change in detail at various scales, including the state scale when appropriate. The EPA identifies eastern Montana as part of the Great Plains region. The following summary characterizes 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 occur.

- 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, recreationalist, 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. 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 (USGCRP 2009, as cited by Climate Change SIR 2010). Climate changes include warming temperatures throughout the year and the arrival of spring an average of 10 days to 2 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 would 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 increases insect populations such as pine beetles, which have killed trees on millions of acres in 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 Montana, additional projected changes associated with climate change described in Section 3.0 of the Climate Change SIR (2010) include:

- Temperature increases in Montana are predicted to be between 3 to 5°F at the mid-21st century. As the mean temperature rises, more heat waves are predicted to occur.
- Precipitation increases in winter and spring in Montana may be up to 25 percent in some areas. Precipitation decreases of up to 20 percent may occur during summer, with potential increases or decreases in the fall.
- For most of Montana, annual median runoff is expected to decrease between 2 and 5 percent. Mountain snowpack is expected to decline, reducing water availability in localities supplied by meltwater.
- Wind power production potential is predicted to decline in Montana based on modeling focused on the Great Falls area.
- Water temperatures are expected to increase in lakes, reservoirs, rivers, and streams. Fish populations are expected to decline due to warmer temperatures, which could also lead to more fishing closures.
- 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 Montana based on a 1°C global average temperature increase to be 241 to 515 percent.

While long-range regional changes might occur within this analysis 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, and 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 spring-time temperatures. Over a 112-year record, overall warming is clearly evident with temperatures increasing 0.21 degrees per decade (Figure B). However, data from 1991-2005 indicate a 0.45 degree per decade cooling trend (Figure C). This example is not an anomaly, as 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 (Climate Change SIR 2010). This information illustrates the difficulty of predicting actual short-term regional or site-specific changes or conditions which may be due to climate change during any specific time frame.

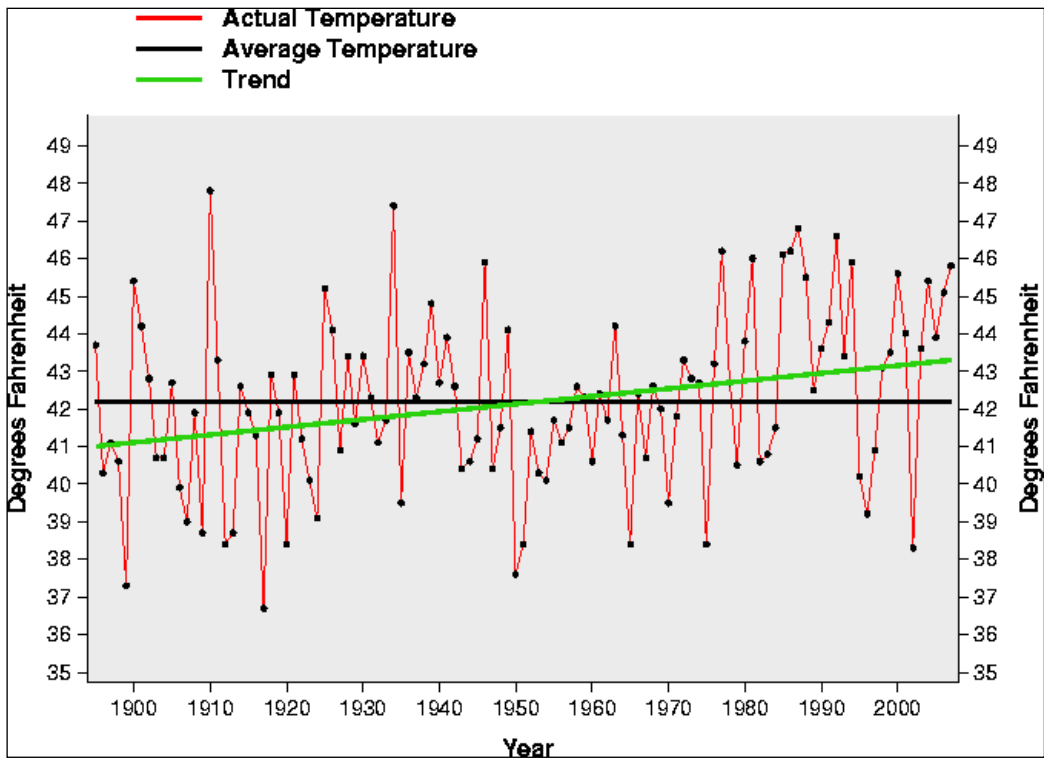


Figure B. Regional climate summary of spring temperatures (March-May) for the West North Central Region (MT, ND, SD, WY), from 1895-2007. (Source: NOAA website – <http://www.ncdc.noaa.gov/oa/climate/research/cag3/wn.html>)

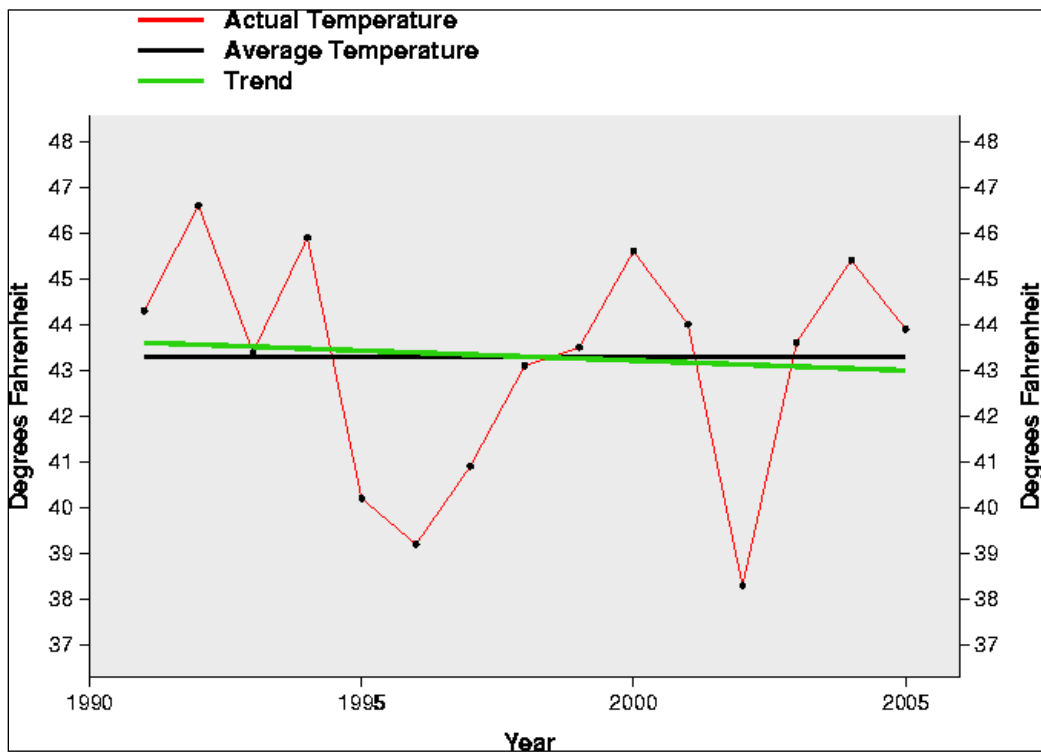


Figure C. Regional climate summary of spring temperatures (March-May) for the West North Central Region (MT, ND, SD, WY), from 1991-2005. (Source: NOAA website – <http://www.ncdc.noaa.gov/oa/climate/research/cag3/wn.html>)

3.3 Soil Resources

The soil-forming factors (climate, parent material, topography, biota, and age) are variable across the planning area, which results in soils with diverse physical, chemical, and biotic properties. Important properties of naturally functioning soil systems include biotic activity, diversity, and productivity; water capture, storage, and release; nutrient storage and cycling; contaminant filtration, buffering, degradation, immobilization, and detoxification; and biotic system habitat.

Reclamation suitability describes the ability of the soil resource to restore functional and structural integrity following disturbance. The rate and degree of recovery is dependent on the action, time of year, and various site characteristics. Soils poorly suited to successful reclamation contain characteristics that include high salt content, poor water-holding capacity, inadequate rooting depth, or highly erosive qualities. Sites poorly suited to reclamation, would require unconventional and/or site-specific reclamation measures.

The lease parcels are located within 6 watersheds [HUC 8 (Hydrological Unit Code); subbasins]: Charles Little Muddy Creeks (HUC 10060005), Little Dry Creek (HUC 10040106), Lower Yellowstone River (HUC 10100004), Lower Yellowstone River-Sunday Creek (HUC 10100001) Poplar River (HUC 10100001), and Prairie Elk-Wolf Creeks (HUC 10060001). The acreage of the lease parcels comprise between less than one percent and two percent of each watershed. Soils considered prime farmlands if irrigated occur within the some watershed-lease parcel areas. The following describes the common soil properties of lease parcels within each watershed:

Charles Little Muddy Creeks (HUC 10060005) watershed contains proposed parcels MTM 102757- 4R and MTM 102757-YM; comprising less than one percent of the watershed. The lease parcels are located in Roosevelt County. Parcel soils generally developed from loamy alluvium, glacial till or residuum derived from the Sentinel Butte (4R) or Tongue River (YM) Member of the Fort Union Formation. Ecological sites are typically Silty (MLRA 58A, 10-14 p. z.). Terrain within the parcels is commonly plain, alluvial fan, or terrace. Approximately 6 percent (apx. 8 ac.) of the parcels are considered poorly suited for reclamation.

Little Dry Creek (HUC 10040106) watershed contains proposed parcel MTM 102757- W3-9 MTM 102757-WN, WP, WQ, WR, WU, WV, WX, WY, X8, X9, XA, XB, XC, XF, XG, XJ, YA, and YB; comprising two percent of the watershed. The lease parcels are located in Garfield and Prairie Counties. Parcel soils generally developed from alluvium or residuum Tongue River Member of the Fort Union Formation. Ecological sites are typically Silty (MLRA 58A, 10-14 p. z.). Terrain within the parcels is commonly plain, alluvial fan, or terrace. Approximately 11 percent (apx. 1,987 ac.) of the parcels are considered poorly suited for reclamation.

The Lower Yellowstone River (HUC 10100004) watershed contains proposed parcel MTM 102757-6D, Q3, Q4, Q6, Q7, V3, V4, V6, MTM 97300 OT, OU, OV, OW, and OX; comprising less than one percent of the watershed. The lease parcels are located in Richland County. Parcel soils generally developed from alluvium derived from the Fort Union Formation. Ecological sites are typically Silty or Clayey (MLRA 58A, 10-14 p. z.). Terrain within the parcels is commonly plain, alluvial fan, or terrace. Soils within the parcel are resilient to disturbances.

The Lower Yellowstone River-Sunday Creek (HUC 10100001) watershed contains proposed

parcels MTM 102757- 43, 44, 46, 47, 48, 49, and 4Y; comprising less than one percent of the watershed. The lease parcels are located in Rosebud County. Parcel soils generally developed from residuum or alluvium derived from the Bear Paw, Judith River, and Gammon Formations. Ecological sites are commonly Silty (MLRA 58A, 10-14 p. z.). Terrain within the parcels is commonly plain, alluvial fan, or terrace. Approximately 57 percent (apx. 1,707 ac.) of the parcels are considered poorly suited to reclamation.

The Poplar River (HUC 10100001) watershed contains proposed parcels MTM 102757-4P; comprising 0.04 percent of the watershed. The lease parcel is located in Daniels County. Parcel soils generally developed from loamy glacial till derived from the Lebo Member of the Fort Union Formation. Ecological sites are typically silty steep (MLRA 58A, 10-14 p. z.). Terrain within the parcels is commonly hills, plains or ridges. Approximately 91 percent (apx. 72 ac.) of the parcels are considered poorly suited to reclamation.

The Prairie Elk-Wolf Creeks (HUC 10060001) watershed contains proposed parcels MTM 102757-PD and PE; comprising 6.18 percent of the watershed. The lease parcels are located in McCone County. Parcel soils generally developed from alluvium, residuum, or glacial till derived from Bearpaw Shale. Ecological sites are commonly Dense Clay, Clayey, or Claypan (MLRA 58A, 10-14 p. z.). Terrain within the parcels is commonly Plains, Alluvial Fans or Terraces. Approximately 31 percent (apx. 84 ac.) of the parcels are considered poorly suited to reclamation.

3.4 Water Resources

3.4.1 Surface Hydrology

Surface water resources across the MCFO are present as lakes, reservoirs, rivers, streams, wetlands, and springs. Water resources are essential to the residents of eastern Montana to support agriculture, public water supplies, industry, and recreation. Water resources and riparian areas are crucial to the survival of many BLM-sensitive fish, reptiles, birds, and amphibians.

Perennial streams retain water year-round and have variable flow regimes. Intermittent streams flow during the part of the year when they receive sufficient water from springs, groundwater, or surface sources such as snowmelt or storm events. Ephemeral streams flow only in direct response to precipitation. Intermittent and ephemeral streams play an important role in the hydrologic function of the ecosystems within the lease parcels by transporting water, sediment, nutrients, and debris and providing connectivity within a watershed. They filter sediment, dissipate energy from snowmelt and storm water runoff, facilitate infiltration, and recharge groundwater (Levick et al. 2008). The pools of intermittent streams retain water in the summer months, supporting riparian vegetation and providing water resources for wildlife and livestock.

Stream morphology is influenced by a number of factors including: stream flow regime, geology, soils, vegetation type, climate, and land use history. Stream conditions reflect a number of historic and current impacts, ranging from agriculture to mining. Surficial geology is generally represented by Tertiary sandstones, siltstones, and shales, with some alluvium and glacial till which tends to form fine grain soils (loams to clays), that are highly erosive. Streambeds consist typically of sand and silt, with few bedrock channels. Stream morphology is highly influenced

by the presence and type of riparian vegetation because streambeds and stream banks generally lack control features (e.g., rocks, cobbles, bedrock).

The lease parcels are located within 6 watersheds [HUC 8 (Hydrological Unit Code); subbasins]: Charlie-Little Muddy Creeks (HUC 10060005), Little Dry Creek (HUC 10040106), Lower Yellowstone River (HUC 10100004), Lower Yellowstone River-Sunday Creek (HUC 10100001), Poplar River (HUC 10060003), and Prairie Elk-Wolf Creeks (HUC 10060001). The acreage of the lease parcels comprise between 0.001 and 6.19 percent of each watershed (USGS 2009).

The Charlie-Little Muddy Creeks watershed contains proposed parcels MTM 102757-4R and YM; comprising 0.010 percent of the watershed. The lease parcels are located in Roosevelt County.

The Little Dry Creek watershed contains proposed parcels MTM 102757-W3, W4, W6 through W9, WN, WP through WR, WU, WV, WX, WY, X8, X9, XA through XC, XF, XG, XJ, YA, and YB; comprising 2.3 percent of the watershed. The lease parcels are located in Garfield and Prairie Counties.

The Lower Yellowstone River watershed contains proposed parcels MTM 102757-6D, Q3, Q4, Q6, Q7, V3, V4, V6, and MTM 97300-OT, OU, OV, OW, and OX; comprising 0.0056 percent of the watershed. The lease parcels are located in Richland County.

The Lower Yellowstone River-Sunday Creek watershed contains proposed parcels MTM 102757-43, 44, 46 through 49, and 4Y; comprising 0.094 percent of the watershed. The lease parcels are located in Rosebud County.

The Poplar River watershed contains proposed parcel MTM 102757-4P; comprising 0.0050 percent of the watershed. The lease parcel is located in Daniels County.

The Prairie Elk-Wolf Creeks watershed contains proposed parcels MTM 102757-PD and PE; comprising 0.021 percent of the watershed. The lease parcels are located in McCone County.

Any beneficial use of produced water requires water rights to be issued by Montana Department of Natural Resources and Conservation (MDNRC) as established by law. This water has been used for watering livestock, irrigation, drilling operations, and industrial applications.

3.4.2 Groundwater

The quality and availability of groundwater varies greatly across the region. Residents in eastern Montana commonly get their ground water from aquifers consisting of unconsolidated, alluvial valley-fill materials, glacial outwash, or consolidated sedimentary rock formations and some coal beds.

Alluvial aquifers within the area generally consist of Quaternary alluvium and undifferentiated Quaternary/Tertiary sediments, which include sand and gravel deposits. Alluvial aquifers occur in terrace deposits and within the floodplains, and along the channels of larger streams,

tributaries, and rivers, and are among the most productive sources of groundwater. They are typically 0-40 feet thick. The quality of groundwater from alluvial aquifers is generally good, but can be highly variable [approximately 100 mg/l to 2,800 mg/l TDS, specific conductance (SC) of 500 to 125,000 microsiemens/centimeter (uS/cm), and sodium adsorption ratio (SAR) of 5.0 to 10]. Wells completed in coarse sand and gravel alluvial aquifers can yield as much as 100 gallons per minute (gpm), although the average yield is 15 gpm. Alluvial deposits associated with abandoned river channels or detached terraces are topographically isolated and have limited saturation and yield as much as 20 gpm (Zelt et al. 1999).

Within the analysis area, the primary bedrock aquifers occur in sandstones and coal beds of the Tertiary Fort Union Formation (Cenozoic rocks), the sandstones of the Cretaceous Judith River formation (Mesozoic rocks), and the sandstones of the Cretaceous Fox Hills formations (Mesozoic rocks). Wells within the Fort Union formation aquifers are typically 100 to 200 feet deep, but can be up to 1500 feet in depth. These wells may produce as much as 40 gpm, but yields of 15 gpm are typical. Where aquifers are confined and artesian conditions exist, wells in the Fort Union Formation will generally flow less than 10 gpm. Well depths within the Judith River formation aquifers are typically 100 to 300 feet deep, but can be greater than 500 feet in depth. Groundwater yields from these aquifers are typically between 5 and 15 gpm, but yields of 30 gpm have been reported. Well depths within the Fox Hills formation aquifers are highly variable, but typically range from 200 to 1,000 feet in depth. Groundwater yields from these aquifers may be as much as 200 gpm, but are generally less than 100 gpm. Artesian wells within these aquifers may flow as high as 20 gpm (Zelt et al. 1999). Groundwater yields from the deeper Paleozoic Madison formation aquifer can range from 20 to 6,000 gpm, or can be higher, in karst areas. The depth to the Madison formation aquifer in the planning area can exceed 6,000 feet. Due to the extreme depth of this aquifer, it is rarely accessed for water use. Water quality of this aquifer is highly variable and is dependent on depth, bedrock type, recharge rate, and other factors.

No lease parcels are proposed in areas of potential coalbed methane (CBM) development, therefore, there pumping of groundwater from the coal bed aquifer to reduce the hydrostatic pressure within the coal would not take place within the nominated parcels.

3.5 Vegetation Resources

The vegetation within the analysis area is characteristic of the Eastern Sedimentary Plains of Montana in the 10 to 14-inch precipitation zone and the Northern Dark Brown Glaciated Plains in the 10 to 14-inch precipitation zone, which lie within the Northern Great Plains. The Northern Great Plains is known for its diverse vegetation types, soil types, and topography. Vegetation is comprised of both tall and short grasses 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. Plant species diversity increases in woody draws and riparian/wetland zones.

Existing influences on local distribution of plant communities include soils, topography, surface disturbance, availability of water, management boundary fence lines, and soil salinity. Vegetation communities have been affected by human activities for over a century. Some of these activities include: infrastructure developments (roads, powerlines, pipelines, etc.),

chemical applications, logging, livestock grazing, farming, and wildfire rehabilitation, prevention, manipulation, and suppression.

The BLM Standards of Rangeland Health (Standards) for BLM administered lands address upland health, riparian health, air quality, water quality, and habitat for native plants and animals. Meeting these Standards ensures healthy, productive, and diverse vegetative resources on public lands. The BLM's policy for implementing the Standards for Rangeland Health (43 CFR §4180.2) provides that all uses of public lands are to complement the established rangeland standards. Application of 43 CFR §4180.2 provides the mechanism to adjust livestock grazing to meet or progress towards meeting Standards for Rangeland Health. Effects of other uses such as oil and gas development or off-highway vehicle use are evaluated against the Standards to provide rationale directing management of these uses.

Six vegetation communities have been identified within the analysis area: native mixed grass prairie, sagebrush/mixed grasslands, ponderosa pine-mixed grassland, agricultural lands, improved or restored pastures, and riparian-wetlands.

There are numerous ecological sites identified within the analysis area, but the primary ones include the following; Claypan (Cy), Sandy (Sy), Sandy-Steep (SyStp), Shallow (Sw), Shallow Clay (SwC), Silty (Si), and Silty- Steep (SiStp). The total dry-weight production expected to be found on these sites during a normal growing season ranges from approximately 800 to 1,500 lbs. /acre.

The native mixed grassland community is dominated by perennial grasses. Perennial grasses can be both warm season and cool season grasses. These perennial grasses 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.

The sagebrush/ mixed grassland community occurs on lower valley slopes near drainages, especially where soils are deeper. This community can include a combination of silver sagebrush (*Artemisia cana*) and Wyoming big sagebrush (*Artemisia tridentata ssp. wyomingensis*). This setting is common throughout the analysis area. The sagebrush/grassland vegetation community has a perennial grass and forb understory, similar to the species found in a mixed native grassland community. The expected species composition on this community consists of 70-75% native grass species, 10-15% forbs, and 5-10% shrubs and half-shrubs.

The ponderosa pine-mixed grassland community generally occurs on moderate-to-steep upland slopes on shallow soils. Ponderosa pine is a minor component of the community canopy cover but is characteristic of the type. Fifty-two percent of canopy cover is provided by grasses, including bluebunch wheatgrass (*Pseudoroegneria spicata*), western wheatgrass, and prairie junegrass, with forbs comprising about 41 percent of cover and 50 percent of herbaceous production. This community type is very limited within the analysis area.

Improved or restored pastures consists of cultivated areas planted with introduced grasses (crested wheatgrass, smooth brome (*Bromus inermis*), intermediate wheatgrass (*Thinopyrum intermedium*), and alfalfa (*Medicago sativa*), specifically for the improved vegetation production for livestock consumption. This setting is limited in the analysis area.

The cultivated plant community is comprised of monocultures of crops which may include small grains, alfalfa, or other crops grown primarily as supplemental feed sources for livestock production operations. These areas have been completely disturbed from the native vegetation potentials. This setting is common in the analysis area.

Wetland areas are defined as “areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient, and which, under normal circumstances, do support, a prevalence of vegetation adapted for life in saturated soil conditions.” Riparian areas are defined as “a form of wetland transition between permanently saturated wetlands and upland areas. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil” (Prichard et. al 1995).

Within the analysis area, riparian and wetland areas would be associated with lakes, reservoirs, potholes, springs, bogs, and wet meadows as well as ephemeral, intermittent, or perennial streams. Riparian and wetland areas are among the most productive and important ecosystems (Prichard et. al. 1995). Characteristically, riparian and wetland areas display a greater diversity of plant, fish, wildlife, and other animal species and vegetative structure than adjoining ecosystems. Adequate, healthy riparian and wetland vegetative buffers protect associated waterbodies from accelerated erosion and sedimentation and reduce or eliminate non-point source pollution from upland areas (MDEQ 2007). Healthy riparian and wetland 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 groundwater recharge and base flow (Eubanks, 2004).

Riparian areas are considered to be some of the most biologically diverse habitats (FSEIS 2008). Some of the more common vegetative species that occur in riparian-wetland areas include prairie cordgrass (*Spartina pectinata*), switchgrass (*Panicum virgatum*), Canada wildrye (*Elymus canadensis*), American licorice (*Glycyrrhiza lepidota*), sedges (*Carex spp.*), rushes (*Juncus spp.*), willow (*Salix spp.*), chokecherry (*Prunus virginiana*), buffaloberry (*Shepherdia argentea*), cottonwood (*Populus spp.*), needleleaf sedge (*Carex duriuscula*), sandbar willow (*Salix exigua*), Nebraska sedge (*Carex nebrascensis*), softstem bulrush (*Schoenoplectus tabernaemontani*), beaked sedge (*Carex rostrata*), yellow willow (*Salix lutea*), common three-square (*Schoenoplectus pungens*), and green ash (*Fraxinus pennsylvanica*). Weedy and invasive species common to riparian areas are knapweed (*Centaurea stoebe*), leafy spurge (*Euphorbia esula*), Russian olive (*Elaeagnus augustifolia*), saltcedar (*Tamarisk ramosissima*), kochia (*Bassia*

prostrata), thistle (*Cirsium arvense*), sweet clover (*Melilotus officinalis*), cocklebur (*Xanthium strumarium*), and gumweed (*Grindelia squarrosa*).

Wetlands provide watering points for wildlife and livestock and provide habitat diversity. Species include sedges (*Carex spp.*), rushes (*Juncus spp.*), bulrush (*Schoenoplectus spp.*), cattail (*Typha spp.*), wild rose (*Rosa spp.*), and snowberry (*Symphoricarpos spp.*). At higher elevations they are associated primarily with springs, seeps, and intermittent streams. Precipitation-dependent wetland sites fluctuate annually, in a range from dry to wet, in direct response to seasonal moisture, temperature, and wind.

From the Montana Natural Heritage Program (MTNHP) provisional mapping GIS data and the USFWS National Wetland Inventory (NWI) GIS data, 21 proposed lease parcels contain approximately 42 acres of delineated riparian or wetland areas (see Table 3). This list is not comprehensive because complete GIS data was not available for 11 of the lease parcels: MTM 102757-43, 44, 46, 47, 48, 49, 4Y, WN, WU, WV, and YA.

Table 3: MTNHP and USFWS Riparian and Wetland Areas by Lease Parcel^{1,2}

Lease Parcel	Riparian/Wetland Type	Classification	Acres
MTM 102757-48	Freshwater Pond	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	0.3
		Palustrine, Unconsolidated Shore, Seasonally Flooded, Diked/Impounded	1.2
MTM 102757-W3	Freshwater Pond	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	1.4
		Palustrine, Unconsolidated Shore, Seasonally Flooded, Diked/Impounded	0.4
MTM 102757-W4	Freshwater Emergent Wetland	Palustrine, Emergent, Temporarily Flooded	0.9
	Freshwater Pond	Palustrine, Unconsolidated Shore, Seasonally Flooded	<0.1
MTM 102757-W6	Freshwater Emergent Wetland	Palustrine, Emergent, Temporarily Flooded	<0.1
		Palustrine, Emergent, Temporarily Flooded, Diked/Impounded	0.3
	Freshwater Pond	Palustrine, Unconsolidated Shore, Seasonally Flooded, Diked/Impounded	0.5
MTM 102757-W8	Freshwater Pond	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	0.2
MTM 102757-W9	Freshwater Emergent Wetland	Palustrine, Emergent, Temporarily Flooded	0.5
		Palustrine, Emergent, Temporarily Flooded, Diked/Impounded	1.6
	Freshwater Pond	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	1.0
		Palustrine, Unconsolidated Shore, Temporarily Flooded, Diked/Impounded	1.8
MTM 102757-WP	Freshwater Emergent	Palustrine, Emergent, Seasonally Flooded	0.1
		Palustrine, Emergent, Temporarily Flooded	0.8
	Freshwater Pond	Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded	0.3
	Riverine	Riverine, Intermittent, Streambed, Seasonally Flooded	7.8

MTM 102757-WQ	Freshwater Emergent Wetland	Palustrine, Emergent, Temporarily Flooded	<0.1
	Freshwater Pond	Palustrine, Aquatic Bed, Semipermanently Flooded	0.2
	Riverine	Riverine, Intermittent, Streambed, Seasonally Flooded	2.8
MTM 102757-WR	Freshwater Emergent	Palustrine, Emergent, Temporarily Flooded, Diked/Impounded	<0.1
	Freshwater Pond	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	<0.1
MTM 102757-WX	Freshwater Emergent Wetland	Palustrine, Emergent, Temporarily Flooded	0.2
		Palustrine, Emergent, Temporarily Flooded, Diked/Impounded	0.4
	Freshwater Pond	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	0.4
MTM 102757-WY	Freshwater Emergent	Palustrine, Emergent, Temporarily Flooded	0.1
		Palustrine, Emergent, Temporarily Impounded, Diked/Impounded	0.1
	Lake	Lacustrine, Littoral, Unconsolidated Shore, Seasonally Flooded, Diked/Impounded	<0.1
MTM 102757-X9	Freshwater Emergent Wetland	Palustrine, Emergent, Temporarily Flooded	0.6
		Palustrine, Emergent, Temporarily Flooded, Diked/Impounded	<0.1
	Riverine	Riverine, Intermittent, Streambed, Seasonally Flooded	7.5
MTM 102757-XA	Freshwater Emergent Wetland	Palustrine, Emergent, Temporarily Flooded	0.6
		Palustrine, Emergent, Temporarily Flooded, Farmed	1.2
MTM 102757-XB	Freshwater Emergent Wetland	Palustrine, Emergent, Temporarily Flooded	0.3
		Palustrine, Emergent, Temporarily Flooded, Diked/Impounded	0.7
	Freshwater Pond	Palustrine, Unconsolidated Shore, Seasonally Flooded	0.2
MTM 102757-XF	Freshwater Emergent Wetland	Palustrine, Emergent, Seasonally Flooded	0.1
		Palustrine, Emergent, Temporarily Flooded	0.6
	Freshwater Pond	Palustrine, Aquatic Bed, Semipermanently Flooded	<0.1
	Riverine	Riverine, Intermittent, Streambed, Seasonally Flooded	2.1
MTM 102757-XG	Riverine	Riverine, Intermittent, Streambed, Seasonally Flooded	1.7
MTM 102757-YA	Freshwater Emergent	Palustrine, Emergent, Temporarily Flooded	0.8
		Palustrine, Emergent, Temporarily Flooded, Diked/Impounded	1.3
	Freshwater Pond	Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded	0.9

¹(USFWS 2010) ² This list is not comprehensive because complete GIS data was not available for 11 of the lease parcels: MTM 102757-43, 44, 46, 47, 48, 49, 4Y, WN, WU, WV, and YA.

Competition from invasive, non-native plants constitutes a potential threat to native plant species and wildlife habitat within the analysis area. Several invasive, non-native plant species are found in the analysis area including: crested wheatgrass (*Agropyron cristatum*), Japanese brome

(*Bromus japonicas*), cheatgrass (*Bromus tectorum*), and foxtail barley (*Hordeum jubatum*). Crested wheatgrass occurs in areas as a result of being planted to increase forage production or to stabilize soils by reducing erosion. Cheatgrass, Japanese brome, and foxtail barley are all aggressive invasive species that out-compete desirable vegetation for water and soil nutrients.

Noxious weeds are invasive species and occur in scattered isolated populations throughout the analysis area. The most common species of noxious weeds are leafy spurge, Russian knapweed, spotted knapweed, field bindweed and Canada thistle. Noxious weed control is the responsibility of the land owner or land managing agency. Chemical and biological control methods are utilized, with chemical control being the more predominant.

3.6 Special Status Species

3.6.1 Special Status Plant Species

According to the MTNHP, there are no known threatened or endangered plant species located within the lease parcels. Eight plant species on the Montana Plant Species of Concern list have been identified as having suitable habitat in areas near these parcels (MTNHP, 2012). These species are listed in the Table 4 and have the potential to exist on the lease parcels. Twelve of these species are also identified as B M “Sensitive” plants.

According to the MTNHP field guide, these plants are typically found in very specific habitats and do not occur predictably across the landscape. Following is a list of Montana’s species of concern that may have existing populations and/or suitable habitat on or near the lease parcels by county:

Table 4. MT Species of Concern and BLM Sensitive Plants in or near lease parcels

Plant Name	Common Name	County	Habitat Description
Phlox andicola*	Plains phlox	McCone and Rosebud	open sites (sand to clay soils)
Rorippa calycina*	Persistent-sepal Yellow cress	McCone	wetland/riparian
Phlox andicola*	Plains phlox	McCone, Sheridan and Rosebud	open sites (sand to clay soils)
Carex crawei*	Crawe’s sedge	Prairie	wetland/riparian
Ipomopsis conjesta ssp pseudotypica	Wyoming ipomopsis	Prairie	wetland/riparian
Carex gravida	Pregnant sedge	Richland	wetland/riparian
Dalea enneandra	Nine-anther prairie clover	Richland	grasslands (plains)
Dalea villosa	Silky prairie clover	Richland	sandy sites
	Nine-anther prairie clover	Richland	grasslands (plains)
	Silky prairie clover	Richland	sandy sites
Lobelia spicata *	Pale-spiked Lobelia	Richland	Moist meadow
Solidago ptarmicoides	Prairie Goldenrod	Richland	Moist meadow
Suckleya suckleya*	Suckleya suckleana	Richland, Roosevelt	wetland/riparian
Viburnum lentago*	Nannyberry	Richland	Riparian forests
Teucrium canadense	American Germander	Roosevelt	Moist meadow
Ipomoea leptophylla	Bush morning-glory	Rosebud	open sites (sandy to gravelly soils)

Pediomelum hypogaeum*	Little Indian Breadroot	Rosebud	Loose, sandy soil of grassland and open pine woodlands on the plains, below sandstone out crops and in blowouts
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* BLM Sensitive

3.6.2 Special Status Animal Species

3.6.2.1 Aquatic Wildlife

For aquatic wildlife in the analysis area there are 9 fish, 2 amphibian, and 2 reptile species that are special status or are sensitive species (Table 5). All of these species depend on perennial and intermittent streams or rivers with intact floodplains, wetlands, and riparian areas that have functional habitat. One fish species, the pallid sturgeon (*Scaphirhynchus albus*), was federally listed as endangered by the U.S. Fish and Wildlife Service in 1990. Threats to the pallid sturgeon are habitat modification, small population size, limited natural reproduction, hybridization, pollution and contaminants, and commercial harvest. The pallid sturgeon inhabits the large river systems of the analysis area. In the analysis area, the Yellowstone River (from the MT/ND border upstream to near Forsyth, MT) and Missouri River (from the MT/ND border upstream to near Fort Benton) are considered pallid sturgeon habitat. Additionally, these large rivers are classified as having the highest concern for fish species (particularly ESA species and species of concern) habitat under the MFWP Crucial Area Planning System (CAPS 2010). The USFWS recently took further action by listing the shovelnose sturgeon (*Scaphirhynchus platorynchus*), which closely resembles the pallid sturgeon, as a threatened species where its range overlaps with the Pallid sturgeon (FWS 2010). In Table 6, endangered or sensitive aquatic wildlife species that occur within each of the lease parcels are listed.

Table 5. Aquatic sensitive or special status wildlife species in the analysis area.

Species	USFWS Status	BLM Sensitive	In Range	Suitable Habitat Present
Pallid Sturgeon	Endangered	Special Status	Yes	Yes
Blue Sucker	None	Sensitive	Yes	Yes
Northern Redbelly X Finescale Dace	None	Sensitive	Yes	Yes
Paddlefish	None	Sensitive	Yes	Yes
Pearl Dace	None	Sensitive	Yes	Yes
Sauger	None	Sensitive	Yes	Yes
Iowa Darter *	None	None	Yes	Yes
Sicklefin Chub *	None	None	Yes	Yes
Sturgeon Chub	None	Sensitive	Yes	Yes
Snapping Turtle	None	Sensitive	Yes	Yes
Spiny Softshell	None	Sensitive	Yes	Yes
Plains Spadefoot	None	Sensitive	Yes	Yes
Northern leopard frog	None	Sensitive	Yes	Yes
Great Plains Toad	None	Sensitive	Yes	Yes

*Iowa Darter and Sicklefin chub are listed as species of concern by the Montana Fish, Wildlife, and Parks.

Table 6. Endangered or sensitive aquatic wildlife species that occur in, or their ranges overlap with, the lease parcels.

Lease Parcel	Endangered or Sensitive Species
MTM 102757-4P	Northern Redbelly X Finescale Dace, Pearl Dace, Plains Spadefoot, Great Plains Toad
MTM 102757-6D	Pallid Sturgeon, Blue Sucker, Paddlefish, Sauger, Sicklefin Chub, Sturgeon Chub, Snapping Turtle, Spiny Softshell, Plains Spadefoot, Great Plains Toad
MTM 102757-PD	Pallid Sturgeon, Blue Sucker, Paddlefish, Sauger, Iowa Darter, Sicklefin Chub, Sturgeon Chub, Plains Spadefoot, Great Plains Toad
MTM 102757-PE	Pallid Sturgeon, Blue Sucker, Paddlefish, Sauger, Iowa Darter, Sicklefin Chub, Sturgeon Chub, Plains Spadefoot, Great Plains Toad
MTM 102757-V4	Pallid Sturgeon, Blue Sucker, Paddlefish, Sauger, Sicklefin Chub, Sturgeon Chub, Snapping Turtle, Spiny Softshell, Plains Spadefoot, Great Plains Toad
MTM 102757-YM	Pallid Sturgeon, Blue Sucker, Paddlefish, Sauger, Iowa Darter, Sicklefin Chub, Sturgeon Chub, Snapping Turtle, Plains Spadefoot, Great Plains Toad
MTM 97300-OT	Pallid Sturgeon, Blue Sucker, Paddlefish, Sauger, Sicklefin Chub, Sturgeon Chub, Snapping Turtle, Spiny Softshell, Plains Spadefoot, Great Plains Toad
MTM 97300-OU	Pallid Sturgeon, Blue Sucker, Paddlefish, Sauger, Sicklefin Chub, Sturgeon Chub, Snapping Turtle, Spiny Softshell, Plains Spadefoot, Great Plains Toad
MTM 97300-OV	Pallid Sturgeon, Blue Sucker, Paddlefish, Sauger, Sicklefin Chub, Sturgeon Chub, Snapping Turtle, Spiny Softshell, Plains Spadefoot, Great Plains Toad
MTM 97300-OW	Pallid Sturgeon, Blue Sucker, Paddlefish, Sauger, Sicklefin Chub, Sturgeon Chub, Snapping Turtle, Spiny Softshell, Plains Spadefoot, Great Plains Toad

Note: The Plains Spadefoot and Great Plains Toad are within range and/or habitat may occur on all lease parcels, the Snapping Turtle is within range and/or habitat may occur on all lease parcels except: MTM 102757-4P, PD, PE; the Spiny Softshell is within range and/or habitat may occur on all lease parcels except: MTM 102757-4P, 4R, PD PE, YM.

3.6.2.2 Terrestrial Wildlife

Evaluating wildlife values at the landscape scale is key to understanding potential impacts of a project. Wildlife values, including terrestrial conservation species, species richness, game quality, and aquatic conservation connectivity, have been mapped at the landscape level for Montana by MFWP through their Crucial Areas Planning System (CAPS) 2010.

The lease parcels were reviewed in the CAPS GIS website as an overlay to potential aquatic, terrestrial, and 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 MFWP employees, are used to further examine resource issues at the site-specific level for the specific resources contained in the lease parcels considered in this EA.

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

Some of these analysis areas provide habitat for species considered as B M “special status species”. Special status species (SSS), collectively, are USFWS federally listed or proposed species, and the B M sensitive species from the 2009 Montana/Dakota’s sensitive species list. BLM sensitive species also include both federal candidate species and delisted species within 5 years of delisting. Table 7 presents the following: a list of species; whether the analysis area is

within the current range of the species; and if so, whether suitable habitat is present within the lease parcels.

Table 7. Analysis area occurrence of BLM terrestrial sensitive species and USFWS threatened, endangered, candidate or proposed terrestrial species

Species	USFWS Status	BLM Status	In Current Range	Suitable Habitat Present
Mammals				
Gray Wolf*	None	Sensitive	No	Not applicable (N/A)
Grizzly Bear**	Threatened	Sensitive	No	N/A
Black-footed ferret	Endangered	Special Status Species (SSS)	No	Yes
Black-tailed prairie dog	None	Sensitive	Yes	Yes
Swift fox	None	Sensitive	Yes	Yes
Fisher	None	Sensitive	No	NA
Meadow Jumping Mouse	None	Sensitive	Yes	Yes
Great Basin Pocket Mouse	None	Sensitive	No	N/A
North American Wolverine	None	Sensitive	No	N/A
Pygmy rabbit	None	Sensitive	No	N/A
Long-legged Myotis	None	Sensitive	Yes	Yes
Long-eared Myotis	None	Sensitive	Yes	Yes
Fringed Myotis	None	Sensitive	No	N/A
Fringe-tailed Myotis	None	Sensitive	No	N/A
Pallid bat	None	Sensitive	No	N/A
Northern Myotis	None	Sensitive	Yes	Yes
Townsend's big-eared bat	None	Sensitive	Yes	Yes
White-tailed prairie dog	None	Sensitive	No	N/A
Birds				
Common loon	None	Sensitive	Yes	Yes
Franklin's gull	None	Sensitive	Yes	Yes
Interior least tern	Endangered	SSS	Yes	Yes
Black tern	None	Sensitive	Yes	Yes
White-faced ibis	None	Sensitive	Yes	Yes
Whooping crane	Endangered	SSS	Yes	Yes
Yellow rail	None	Sensitive	Yes	Yes
Piping plover	Threatened, with critical habitat	SSS	Yes	Yes
Mountain plover	None	Sensitive	Yes	possible
Marbled godwit	Bird of Conservation Concern (BCC)	Sensitive	Yes	Yes
Long-billed curlew	BCC	Sensitive	Yes	Yes
Black-crowned night heron	None	Sensitive	Yes	Yes
Bobolink	None	Sensitive	Yes	Yes
Greater sage-grouse	Candidate	Sensitive	Yes	Yes

Species	USFWS Status	BLM Status	In Current Range	Suitable Habitat Present
Burrowing owl	BCC	Sensitive	Yes	Yes
Great gray owl	None	Sensitive	No	NA
Three-toed woodpecker	None	Sensitive	No	NA
Trumpeter swan	None	Sensitive	yes	possible
Flammulated owl	None	Sensitive	No	NA
Bald eagle***	BCC	Sensitive	Yes	Yes
Golden eagle	None	Sensitive	Yes	Yes
Ferruginous hawk	None	Sensitive	Yes	Yes
Swainson's hawk	None	Sensitive	Yes	Yes
Peregrine falcon	None	Sensitive	Yes	unlikely
Northern goshawk	None	Sensitive	Yes	unlikely
Sage thrasher	BCC	Sensitive	Yes	Yes
Sprague's pipit	Candidate	Sensitive	Yes	Yes
Sedge wren	None	Sensitive	Yes	Yes
Loggerhead shrike	BCC	Sensitive	Yes	Yes
Chestnut-collared longspur	BCC	Sensitive	Yes	Yes
McCown's longspur	BCC	Sensitive	Yes	Yes
Baird's sparrow	BCC	Sensitive	Yes	Yes
Brewer's sparrow	BCC	Sensitive	Yes	Yes
eConte's sparrow	None	Sensitive	Yes	Yes
also n's Sharp-tailed sparrow	None	Sensitive	Yes	Yes
Horned grebe	BCC	None	Yes	Yes
American bittern	BCC	None	Yes	Yes
Prairie falcon	BCC	None	Yes	Yes
Upland sandpiper	BCC	None	Yes	Yes
Yellow-billed Cuckoo	BCC	Sensitive	Yes	Yes
Short-eared owl	BCC	None	Yes	Yes
ewis's woodpecker	BCC	None	No	NA
Red-headed woodpecker	BCC	Sensitive	Yes	Yes
Black-backed woodpecker	None	Sensitive	No	NA
Sage sparrow	BCC	Sensitive	No	NA
Grasshopper sparrow	BCC	None	Yes	Yes
Dickcissel	BCC	Sensitive	Yes	Yes
Blue-gray natcatcher	None	Sensitive	No	N/A
Harlequin duck	None	Sensitive	No	N/A
Reptiles				
Snapping turtle	None	Sensitive	Yes	Yes
Spiny softshell	None	Sensitive	Yes	Yes
Greater short-horned lizard	None	Sensitive	Yes	Yes
Milk snake	None	Sensitive	Yes	Yes
Western hog-nosed snake	None	Sensitive	Yes	Yes

Table 7 sources: Montana Bird Distribution Committee 2012; Werner, Maxell, Hendricks, and Flath. 2004; Foresman 2001; MTNHP, 2010; BLM, 2009; USDA – NRCS Plants Database, 2010

*Gray wolf has been delisted so has been moved to the sensitive list

**Grizzly bear has been delisted for the Greater Yellowstone ecosystem. In that area it is a Bureau sensitive species.

***Bald eagle has been delisted so has been moved to the sensitive list.

3.6.2.3 Threatened, Endangered, Candidate, and Proposed Species

Threatened, endangered, or candidate bird species may occupy habitat infrequently or seasonally within the analysis area. These species include the whooping crane, interior least tern, piping plover, greater sage-grouse, hereafter referred to as sage grouse, and Sprague's pipit. In addition, the black-footed ferret is on the USFWS species list for Rosebud and McCone County. (http://www.fws.gov/montanafieldoffice/Endangered_Species/Listed_Species.html)

The USFWS has identified a primary migration corridor for the Aransas-Wood Buffalo population of whooping cranes (http://ecos.fws.gov/docs/recovery_plan/070604_v4.pdf). Lease parcels 4P in Daniels County, 4R and YM in Roosevelt, and parcels OT, OU, OW, Q3, Q4, Q6, Q7, V3, V4, 6D, OX, and V6 in Richland County are located within this primary migration corridor. Nesting by whooping cranes has not been documented in the analysis area; however, stopover observations have been documented.

Interior least terns migrate up both the Missouri and Yellowstone rivers and utilize gravel bars along these rivers for nesting. Lease parcels PD and YM are located along the Missouri River. Historic nesting by least terns has been documented to occur from 1.7 and 0.87 miles from these parcels at the nearest point, respectively. Lease parcels V4 and 6D are located within the Yellowstone River corridor; however, least tern nesting has not been documented in the immediate area.

Piping Plover nest along the Missouri River, as well as select nesting locations on wetland habitats in the northeast Montana pothole region. The USFWS has designated 3 separate "units" as critical habitat for piping plover in Montana. (<http://www.fws.gov/mountain-prairie/species/birds/pipingplover/>) Unit 1 designates wetlands across approximately 12 townships located in the northeast corner of the state. No parcels are located within unit 1. The USFWS designated Unit 2 as the portion of the Missouri River from river mile 1,712 (south of Wolf Point, MT) to river mile 1,586.6 (North Dakota border) as critical habitat for the piping plover. Lease parcels PD and YM are located within or immediately adjacent to the Unit 2 critical habitat designation for piping plover. The nearest recorded nesting location by piping plovers is approximately 1.49 miles northwest of parcel YM. Unit 3 designates habitat around Fort Peck Reservoir. No lease parcels are located adjacent to Unit 3.

Black-footed ferrets are classified as endangered by the USFWS. No black-footed ferret reintroduction sites are located within the field office. A black-footed ferret re-introduction site exists north of Fort Peck Lake on Charles M. Russell National Wildlife Refuge (CMR) lands and on lands administered by the BLM- Malta Field Office. It is likely that the Missouri River and Fort Peck Lake act as geographic barriers to isolate the re-introduction population from expanding into the analysis area.

Black-footed ferrets require prairie dog colonies for survival. According to USFWS guidelines for determining suitable black-footed ferret habitat (USFWS, 1989), a black-tailed prairie dog complex suitable to support ferrets is defined as an aggregation of two or more neighboring prairie dog towns separated by a distance of less than 4.34 miles and totaling 80 acres or more. Recently, the separation distance has been reduced to 1.5 km (.93 miles) (Hanebury, pers. com 2010) to be considered within the range of habitat use by black-footed ferrets. Portions of 3

potential prairie dog colonies are located within proposed lease parcels 47, 48 and 49 in McCone County. The colony that intersects with lease parcel 47 is approximately 40 acres, colony intersecting parcel 48 is approximately 5 acres, and the colony intersecting parcel 49 is approximately 320 acres. In addition, other colonies have been documented within 0.93 miles of the colonies on the lease parcels, and could form a complex that may potentially meet the criteria to support black-footed ferrets. However, surveys were completed in 2004, and acreages may have changed since then. The potential for any native viable population of black-footed ferrets to exist anywhere outside of re-introduction sites is extremely unlikely (<http://www.fws.gov/mountain-prairie/species/mammals/blackfootedferret/>).

Two species recently classified as USFWS candidate species occur within the analysis area. These are the Sprague's pipit and the greater sage grouse. Candidate species are those that warrant protection under the Endangered Species Act, but listing the candidate species is precluded by the need to address other listing actions of a higher priority. The USFWS will review the need for listing these species annually and will propose the species for protection when funding and workload for other listing actions allow.

Sprague's pipits were found warranted, but precluded as a threatened or endangered species on September 15, 2010. 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). Sprague's pipits will use nonnative planted grassland (Higgins et al. 2002, pp. 46-47; Dechant et al. 1998, p. 3; Dohms 2009, pp. 77-78, 88). Vegetation structure may be a better predictor of occurrence than vegetation composition (Davis 2004, pp. 1135, 1137). (Federal Register: September 15, 2010 (Volume 75, Number 178)) Montana Natural Heritage Tracker has documented observations of Sprague's pipits in Daniels, Sheridan, Roosevelt, McCone, Richland, Dawson, Prairie, Custer, and Fallon Counties within the Miles City Field Office. A total of 39 of the proposed lease parcels have been identified as providing potential suitable habitat for Sprague's pipits based on a Sprague's pipit suitable habitat model utilized by the Montana Department of Fish, Wildlife, and Parks (<http://apps.fwp.mt.gov/gis/maps/caps/>). Ground-truthing of the parcels has not occurred to document actual habitat use by Sprague pipits, or that suitable habitat exists within all of the parcels identified by the model. However, it is likely that all or the majority of these parcels provide suitable habitat for this Sprague's pipits. These include parcels 46, 48, WN, WV, XF, XG, WP, WQ, X9, X8, YA, WR, XJ, WX, WY, W3, W4, YB, W6, W8, W7, W9, XB, XC, PD, PE, 4P, YM, OV, OW, Q4, Q6, Q7, V3, V4, 6D, OX, V6, and 4R.

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.

Instruction Memorandum (IM) No. 2012-043 (BLM, 2011) identified Preliminary Priority Habitat (PPH), and Preliminary General Habitat (PGH) polygons for sage grouse in the planning area. Both delineations are being considered in the future MCFO RMP planning effort. In addition, IM No. 2012-043 provides conservation policies and procedures for sage grouse management within these polygons. Lease parcels, or portions of, located within PPH polygon delineated areas include parcels MTM 102757 43, 44, 46, 47, 48, 49, and 4Y.

In addition, all or portions of 25 lease parcels are located within PGH polygon delineated areas. Of the 25 lease parcels, 5 lease parcels (WP, WY, W7, W9, and XB) are located within 0.25 miles of sage grouse lek locations; and 20 lease parcels (XF, XG, WP, WQ, X9, X8, YA, WR, XJ, WX, WY, W3, W4, YB, W6, W8, W7, W9, XB, and XC) are located within 2 miles of lek locations.

3.6.2.4 Other Sensitive Species

As noted in Table 6 above, up to 48 wildlife species considered as B M “sensitive” have the potential to occur within the analysis area. These include 33 birds, 7 mammals, 3 amphibians, and 5 reptiles. This list is a combination of recent and historic observations. In some instances, historic observations are the only known record. If a species is noted as in range, it signifies that habitat within the field office would be considered within the documented range of occupation of habitat by a particular species during some phase of its life cycle. This might be only for a short time frame, during migrations, seasonally, or possibly year-round. Documentation of occupation of habitat by specific wildlife species is considered good across this area for some species, (e.g., sage grouse) and lacking for other species (small mammals, herptiles, raptors, etc.). However, the table documents the potential for wildlife species occurrence if at least one lease parcel is located within a particular sensitive species’ known range of habitat occupation based on available science and research.

Various bird surveys throughout different years have been conducted across the MCFO, which may have included some of the lease parcel areas or at least similar habitats. Surveys have been conducted by the United States Geological Survey, University of Montana Avian Science Center, Rocky Mountain Bird Observatory, MTNHP, and other interested “birders.” Migratory bird species diversity varies across the MCFO area. According to P.D. Skaar’s Montana Bird Distribution, 6th edition (Lenard et al., 2003) species diversity ranges from less than 40 species per “latilong” (~3,200 square miles) to more than 200 across the analysis area.

The analysis area provides potential nesting, foraging, and migratory habitat for various species of raptors; however, recent surveys for raptor nests have not occurred. There are 14 lease parcels that either contain or are located within 0.5 miles of historic raptor nests. These lease parcels include XF, WP, WX, WY, W3, XB, XC, OU, V4, 6D, WR, XJ, W4, and XA. Raptor species documented to occupy these nests at the time of the surveys include great-horned owls, red-tailed hawks, merlins, American kestrels, prairie falcons, ferruginous hawks, and some unidentified raptors. Other species that would be expected within the analysis area include northern harriers, bald and golden eagles, sharp-shinned hawks, cooper’s hawks, Swainson’s hawks, and burrowing owls, Peregrine falcons are also known to migrate through eastern Montana.

3.7 Fish and Wildlife

3.7.1 Aquatic Wildlife

The aquatic resources in the analysis area include aquatic wildlife and habitat for fish, aquatic arthropods (insects and crustaceans), amphibians, reptiles, and bivalves. The habitat consists of rivers, streams, lakes, and reservoirs that provide habitat for a variety of aquatic wildlife and riparian communities (and their varying lifecycle stages).

Based on known fish presence (MFWP 2010), there are approximately 16 miles of fish-bearing streams within the analysis area on BLM lands, but due to ongoing inventory efforts, the discovery of more prairie streams that support native fish and other aquatic wildlife would occur. Additionally, prairie fish are constantly moving through a landscape that balances, at the local and landscape scale, between drying and flooding stages. Consequently, the ability to migrate during high flows is a crucial life history strategy.

Aquatic resource conditions of streams are strongly related to riparian vegetation, upland range conditions, land use impacts, and quality and quantity of in-stream water. Habitat conditions throughout the analysis area vary between and within water bodies; the upper and middle reaches of smaller streams may be intermittent, while the lower reaches may receive perennial flows, resulting in different habitat conditions and different aquatic communities within the same stream. Prairie fish are adapted to these cycles of drying and flooding and thrive in these intermittent pools, provided land-use impacts are not severe (Bramblett et al. 2005). However, prairie streams are highly sensitive to disturbance, and due to this factor many prairie stream ecosystems are already imperiled due to anthropogenic activities (Dodds et al. 2004).

Riparian vegetation is a critical component in maintaining aquatic wildlife habitat and is a source of organic nutrients and food items for the prairie stream ecosystem, provides in-stream habitat for fish, amphibians, reptiles, and invertebrates, adds structure to the banks, and reduces erosion; when riparian vegetation senesces and falls into the stream, it adds cover, habitat complexity, and moderates water temperatures. In some cases throughout the analysis area, riparian habitats have been degraded, and the results include increases in erosion and sedimentation, shallower and wider streams (which increases evaporation and thus decreases water quality and quantity), increases in temperature fluctuations, and critically low oxygen content levels; these effects collectively reduce or degrade available aquatic wildlife habitat.

Existing factors limiting or affecting aquatic resources in the analysis area include the lack of a normative flow regime primarily through extensive reservoir development; loss or degradation of riparian habitat; habitat fragmentation; livestock grazing damage; past and current oil and gas development; un-passable fish & aquatic wildlife culverts, oil skimmers, and other stream crossings; and excess siltation due to the various land use activities.

3.7.2 General Wildlife

A diversity of topography and vegetation types exists across the analysis area. This diversity 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. 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 can be expected to reduce habitat suitability for some species of wildlife intolerant to human activities.

The analysis area supports a wide variety of game and nongame species. 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, past surveys document what species occur, and provides insight into what other species can be expected to occur within existing habitat types.

Mule deer are the most abundant big game species and use the greatest variety of habitats, generally preferring sagebrush, grassland, and conifer types (BLM 1984). 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). Habitat such as riparian bottoms, agricultural areas, and forests are used as well, both yearlong or seasonally. Habitat to support mule deer exists within all of the lease parcels.

Winter range is often part of year-round habitat in eastern Montana. Winter ranges are typically in areas of rougher topography and are often dominated by shrub species that provide crucial browse during winter months. Rough topography also provides critical escape and thermal cover important for maintenance and survival. Of the 49 proposed lease parcels, 8 are located within mule deer winter range. These include parcels 43, 44, 47, 48, 49, 4Y, PE, and YM.

White-tailed deer are common in the analysis area. White-tailed deer prefer riparian drainage bottoms, hardwood draws, and conifer areas, but they will also use a variety of other habitats including farmlands. During the winter, white-tailed deer using forested areas prefer dense canopy classes, moist habitat types, uncut areas, and low snow depths. Suitable winter range is a key habitat factor for white-tailed deer, and winter concentration areas occur almost exclusively in riparian and wetland habitats and dense pine (Youmans and Swenson 1982). Although white-tailed deer move on and off winter range, as dictated by seasonal habitat requirements, the animals do not migrate for long distances (Hamlin 1978). A total of 11 parcels are proposed for lease within delineated crucial white-tailed deer winter ranges. These parcels include PD, PE, YM, OT, OU, OV, OW, Q6, Q7, V4, and 6D.

Pronghorn antelope are widely distributed across the analysis area. They are generally associated with grasslands and shrublands, but they also seasonally 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. Crucial winter ranges for pronghorn have been identified within the analysis area, and encompass 16 parcels. These include parcels 43, 47, 49, XF, XG, WP, WQ, X9, X8, YA, WR, XJ, WX, WY, XB, and XC.

The potential exists for other big game species to occupy the areas. Species include elk, moose, mountain lion, and black bear although presence would likely occur as individual's transition to preferred habitats elsewhere.

The potential for big game movements or migrations through eastern Montana 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.

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. Portions of 2 lease parcels are located on or within 0.25 miles of sharp-tailed grouse leks. In addition, 20 parcels are located within 2 miles of sharp-tailed grouse leks, and most, if not all, of these parcels would be expected to provide at least seasonal habitat for sharp-tailed grouse. These parcels include 46, XF, XG, WP, WQ, X9, X8, YA, WY, W3, YB, W6, W8, W7, W9, XB, XC, OT, OU, OW.

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

3.8 Cultural Resources

BLM is responsible for identifying, protecting, managing, and enhancing cultural resources located on public lands or those that may be affected by BLM management actions on non-federal lands. Cultural resources include archaeological, historic, architectural properties, and traditional lifeway values important to Native Americans. Sites can vary with regard to their intrinsic value as well as their significance to scientific study; therefore, management practices employed are commensurate with their designation. Significant cultural resources values include; their use to gather scientific information on human culture, history, interpretive and educational value, values associated with important people and events of significance in history, and often aesthetic value, as in a prehistoric rock art panel or an historic landscape.

A generalized prehistory of eastern Montana can be categorized in a chronological framework, and time periods are distinguished on the basis of differences in material culture traits or artifacts and subsistence patterns: the PaleoIndian period (ca. 12,500 BP-7800 BP), Archaic period (ca. 7800 BP-1500 BP), Prehistoric period (ca. 1500 BP-200 BP), Protohistoric period (ca. 250 BP-100 BP), and Historic Periods (A.D. 1805-A.D. 1960) (Aaberg et al 2006).

Cultural properties are evaluated with reference to the National Register of Historic Places criteria for the purposes of assessing their historical values and public significance; such evaluations are carefully considered when cultural properties are allocated to use categories, although preservation and nomination of these properties must be weighted on a case-by-case basis.

A recent Class I overview of cultural resources was prepared for the analysis area (Aaberg et al 2006). The cultural environment of the MCFO as of May 2005 contained 7,065 prehistoric and 2,869 historic archeological sites as well as 1,929 paleontological localities. Archeological properties (historic and prehistoric sites) occur in all counties encompassed by the field office. The seven counties with nominated lease parcels contain 31.9% percent of all prehistoric and 39.8% of all historic resources within the MCFO. Each county contains the following percentages of resource site types within its boundaries: Daniels 0.6% prehistoric 1.7% historic; McCone 2.3% prehistoric 4.3% historic; Richland 2% prehistoric, 6.1% historic; Roosevelt 3.7%

prehistoric, 6.2% historic; Rosebud 18.4% prehistoric, 11.2% historic; Garfield 2.2% prehistoric, 5.1% historic, and Prairie 2.7% prehistoric, 5.2% historic.

The overall archeological site density of the MCFO (historic and prehistoric) is estimated at one site per 93 acres (Aaberg et al 2006). Prehistoric sites are estimated to be distributed at one site per 130.8 acres (4.9 per square mile) and historic sites at one site per 322 acres (two per square mile) for all surveyed acres within the MCFO. Approximately 10% to 15% of all sites are found to be eligible for the National Register of Historic Places.

A review of the Montana State Historical Preservation Office (SHPO) Cultural Resource Information System (CRIS) and Cultural Resource Annotated Bibliography System (CRABS), as well as BLM Cultural Resource databases and GIS data, indicates 14 lease parcels (MTM 102757- 43, 44, 46, 47, 48, 49, 4Y, WN, WU, WV, XF, XG, WP, WQ, X9, X8, YA, WR, XJ, WX, WY, W3, W4, YB, W6, W8, W7, W9, XA, XB, XC, PD, PE, 4P, YM, 4R, Q3, Q4, Q6, Q7, V3, V4, 6D, OX and MTM 97300- OT, OU, OV, OW contain recorded cultural sites within the lease parcel boundaries. Inventory data is not available for a majority of individual lease parcels; however some parcels have incomplete coverage of cultural resource inventory.

There are four cultural site types identified within the boundaries of the reviewed parcels. They include multiple historic vehicular/footbridges bridges 24RL0122, 24RL0196, 24RL0175 & 24RL0138. Two of the bridges are Queen Post Pony single span bridges constructed circa 1908 as part of the USRS main canal crossings. The third bridge 24RL0138 has very little information recorded. It is not of the same construction type as the others and has likely been upgraded since its reported age in 1938. The two queen Pony post bridges are considered eligible for listing on the National Register of Historic Places. There is no eligibility information for 24RL0138.

These bridges are directly associated with site 24RL0204, the Lower Yellowstone Irrigation Project. This is a series of irrigation canals that begins near Glendive, MT and continues to near the confluence of the Yellowstone and the Missouri Rivers. The Lower Yellowstone Irrigation Project saw its construction started in 1905 and was completed by the mid-1920's. It is among the first large scale irrigation systems constructed to promote settlement of semi-arid lands in the west (Kordecki et. al 2000). The irrigation system was designed to service approximately 50,000 users. The irrigation system has operated without major modification to its form or function. Detailed information can be located in the references under Kordecki et. al 2000.

Other historic site types identified within the parcels are a historic energy development site known as the Cabin Creek to Williston Pipeline. The pipeline was constructed in the 1930 and runs from Fallon county to Williston North Dakota, 93.3 miles. The site is considered eligible for Listing on the National Register of Historic Places. Site 24RL0272 is the last historic site identified within the boundaries of a lease parcel and is a trash dump and building foundations. This site is determined through the CRIS database as ineligible.

There was one prehistoric site identified within the boundaries of a lease parcel. The site is the Nollmeyer site (24RL1004). The Nollmeyer site is a unique site type to Eastern Montana and the Yellowstone River. Recently published article in 2012 reports analysis of artifacts and supports it position in chronological contemporaneity with other Middle Missouri River cultural

traditions (Johnson et. al 2012). The Nollmeyer site is among the few fortified earthlodge villages with large amounts of ceramics, not only in Montana but also the Dakotas. The article also outline the results of limited excavation that was conducted in 1983, which served to identify if intact buried material were present as well as collecting chronologically datable material. Results of the dated material suggest that the occupation of the site occurred between A.D. 1675 and 1725. These dates as well as cross dating the ceramics at the site have established that the site agrees with what is known as The Northern Extended Coalescent village site within the Missouri River Tradition of Plains chorology (Johnson et. al 2012). The site is considered eligible for Listing on the National Register of Historic Places and is also likely to be of interest to Native American concerns.

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 are rooted in that community's history and are important in maintaining the continuing cultural identity of the community.

Areas of tribal concern in southeast Montana are listed in Appendices B-E of the Ethnographic Overview of Southeast Montana (Peterson and Deaver 2002). Based on input from various tribes, the 2002 Ethnographic Overview also identified 12 sensitive site types. These include battlefield and raiding sites, burials, cairns, communal kills, fasting beds (vision quests), homesteads, medicine lodges, rock art, settlements (campsites), stone rings, spirit homes, and environmental places (plant gathering areas, mineral and fossil collection areas).

The Crow Tribe's 2002 document noted rock art, fasting sites, siege sites, camp sites, mourning sites, final resting places (burials), buffalo jumps, and environmental areas, including animal habitats and natural areas of concern such as springs. The Northern Cheyenne Tribe in its 2002 document noted large ring sites (both in terms of ring diameters and ring numbers), isolated fasting beds, rock art sites, and large diameter fasting structure as having religious significance to the tribe.

Although not identified as a site type of concern, a parcel contains a portion of the Nollmeyer Site. The Nollmeyer Site is described as an Extended Coalescent Village Site (Johnson et al. 2012). Coalescent Village Sites are more common along the Missouri in North and South Dakota and are thought to be related to the Arkikara. Overall the site type is rare in Montana and presently limited to two or three possible sites along the Lower Yellowstone. See Section 3.8 Cultural Resources for additional details.

3.10 Paleontology

According to Section 6301 of the Paleontological Resource Protection Act of 2009 Omnibus Public Lands Bill, Subtitle D, SEC. 6301, paleontological resources are defined 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” (Paleontological Resource Protection Act of 2009 Omnibus Lands Bill, Subtitle D, SEC. 6301-3612 (P.L. 59-209; 34 Stat. 225; 16 U.S.C. 431-433). All vertebrate fossils, be they fossilized remains, traces, or imprints of vertebrate organisms, are considered significant. Paleontological resources do not include archaeological and cultural (typically human graves) resources.

Paleontological localities are generally not considered eligible for the National Register of Historic Places as individual fossil localities; however, they may be eligible under National Register criteria A, B, and D for other reasons (e.g., the development of paleontology in Montana, association with important events such as exploration surveys, association with paleontologists, for their contribution to understanding of the paleohistory of an area).

The BLM utilizes the Potential Fossil Yield Classification (PFYC) as a planning tool for identifying areas with high potential to yield significant fossils. The system consists of numbers ranging from 1-5 (low to high) assigned to geological units, with 1 being low potential and 5 being high potential to have significant fossil resources. It should be pointed out that the potential to yield significant fossil resources is never 0. Rock units not typically fossiliferous can in fact contain fossils in unique circumstances.

BLM classified geologic formations that have a high Potential Fossil Yield Classification (PFYC) of 3 or higher should be specifically reviewed for paleontological resources. The MCFO has the following classifications on the relevant geologic units:

Quaternary deposits	Class 2
Ft Union	Class 4
Hell Creek	Class 5
Lance	Class 5
Fox Hills	Class 3
Bearpaw	Class 3
Judith River	Class 4
Claggett	Class 3
Gammon	Class 3

All or part of 38 lease parcels (MTM 102757 43, 44, 46, 47, 48, 49, 4Y, WN, WU, WV, XF, XG, WP, WQ, X9, X8, YA, WR, XJ, WX, WY, W3, W4, YB, W6, W8, W7, W9, XA, XB, XC, PD, PE, 4P, Q3, and Q4) include geologic units rated as PFYC 3-5. Eleven parcels (MTM 102757 YM, Q6, Q7, V3, V4, 6D, V6, and MTM 97300 OT, OU, OV, and OW) do not include units that are rated higher than 3, however, there is still a potential in those parcels for fossils. So, any discovery of fossils in these deposits would be significant.

3.11 Visual Resources

BLM Visual Resource classifications are only applied to BLM surface, as such, the affected environment for visual resources only consists of approximately 10,786 acres of BLM - administered surface in the analysis area (Table 8).

A Class II VRM area classification means that the character of the landscape has unique combinations of visual features such as land, vegetation, and water. The existing character of the landscape should be retained. Activities or modifications of the environment should not be evident or attract the attention of the casual observer. Changes caused by management activities must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

A Class III VRM area classification means the level of change to the character of the landscape should be moderate. Changes caused by management activities should not dominate the view of the casual observer and should not detract from the existing landscape features. Any changes made should repeat the basic elements found in the natural landscape such as form, line, color and texture.

A Class IV VRM area classification means that the characteristic landscape can provide for major modification of the landscape. The level of change in the basic landscape elements can be high. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Table 8: VRM Classes for the analysis area by lease parcel

Leasing Areas	VRM Class II Acres	VRM Class III Acres	VRM Class IV Acres
<i>McCONE COUNTY</i>	<i>192 total acres</i>	<i>0 total acres</i>	<i>0 total acres</i>
MTM 102757-PD	192		
<i>PRAIRIE COUNTY</i>	<i>0 total acres</i>	<i>5,055 total acres</i>	<i>4,035 total acres</i>
MTM 102757-W3			638
MTM 102757-W9			319
MTM 102757-WP		1,024	12
MTM 102757-WR		690	271
MTM 102757-WX			315
MTM 102757-WY			957
MTM 102757-X8		160	
MTM 102757-X9		459	819
MTM 102757-XB		1,277	
MTM 102757-XF		333	304
MTM 102757-XJ		15	305
MTM 102757-YA		1,097	95
<i>ROOSEVELT COUNTY</i>	<i>38 total acres</i>	<i>0 total acres</i>	<i>0 total acres</i>
MTM 102757-YM	38		
<i>ROSEBUD COUNTY</i>	<i>0 total acres</i>	<i>313 total acres</i>	<i>1,128 total acres</i>
MTM 102757-43			640
MTM 102757-46		313	9
MTM 102757-47			160
MTM 102757-49			319

3.12 Forest and Woodland Resources

Evergreen forest habitat types occurring in the analysis area include ponderosa pine (*Pinus ponderosa*), limber pine (*Pinus flexilis*), Douglas-fir (*Pseudotsuga menziesii*), and Rocky Mountain juniper (*Juniperus scopulorum*). Deciduous forest habitat types include green ash (*Fraxinus pennsylvanica*) and boxelder (*Acer negundo*) (Hansen et al. 2008). Ponderosa pine and Rocky Mountain juniper forest types occur on the majority of analysis area forestlands. Green ash and boxelder forest types occur along woody draws, streams, rivers, lakes, reservoirs, ponds, and other wet areas. Moisture (along with soil type, nutrient availability, plant density, topography, and climate) is one of the most important factors affecting plant growth; lack of moisture can have a pronounced influence on overall productivity (Hansen et al. 2008). Table 9, summarizes forest and woodland acres in the analysis area by forest type and individual parcel.

Table 9. Forestland Acreage and Forest Type by Lease Parcel

Lease Parcel	Evergreen Forest	Deciduous Forest	Mixed Forest	Total Acres
MTM 102757-43		1.55		1.55
MTM 102757-47		1.29		1.29
MTM 102757-49		0.44		0.44
MTM 102757-PD		3.84	36.14	39.98
MTM 102757-W3		0.88	0.66	1.54
MTM 102757-W9		0.33	0.80	1.13
MTM 102757-WP	7.45	10.21	3.68	21.34
MTM 102757-WR	1.55	5.61	2.00	9.16
MTM 102757-WX	0.22	0.44	0.44	1.10
MTM 102757-X9	1.72	4.56	1.11	7.39
MTM 102757-XB	8.00	8.00	2.00	18.00
MTM 102757-XF	4.53	2.88	0.22	7.63
MTM 102757-XJ	0.66	0.44	0.22	1.32
MTM 102757-YA		1.55	0.44	1.99
MTM 102757-YM		2.42		2.42
Total	24.13	44.44	47.71	116.28

Source: LANDFIRE Vegetation Cover Types, 30-meter resolution, Veg Codes 2054 or 2179 for Conifer Forest, 162 for Hardwoods (Bur Oak)

Historically, many forests in the analysis area consisted of open and park-like stands of ponderosa pine and juniper intermixed with hardwood draws. Mature stands were dominated by large ponderosa pine trees with an understory of native bunchgrasses and low shrubs. Prior to European settlement, fires ignited by lightning and Native Americans frequently burned throughout the analysis area, with fire return intervals of 35 to 40 years (Arno and Gruell 1983). High-frequency low-intensity fires kept forests open and removed understory vegetation, down material, and tree regeneration; resulting in irregularly shaped patches and groups of trees varying in age, size, and density across the landscape.

In the early 1900s, implementation of aggressive fire suppression tactics dramatically interrupted the historic role of fire in ponderosa pine ecosystems; resulting in species composition and structural changes and increased stand density levels. Subsequently, vegetative communities shifted towards late successional stage forests and woodlands. Forests and woodlands have declined in overall health and productivity and are less resilient to disturbances. Overstocked forests and woodlands experience increased stress due to competition for growing space (e.g.,

water, sunlight, and nutrients). Consequently, these conditions have increased the susceptibility of forested areas to insect attacks, disease, and the risk of stand-replacing fires.

Since the late 1800s, intensive grazing in eastern Montana has removed fine grass fuels that historically carried low-intensity fires over large areas each year (Clark and Sampson 1995). As a result of both fire suppression and livestock grazing, juniper became established on sites that were previously grass-covered and maintained by periodic wildfires (Smeins and Fuhlendorf 1997). Trees are now growing on sites where natural disturbance historically limited their presence.

Forest and woodland health within the analysis area will continue to deteriorate without implementation of management treatments to reduce fuel accumulations and restore existing stands to desired conditions by improving the overall vigor, productivity, and resiliency of forested vegetation. Selective thinning and removal of vegetative resources through hand and mechanical methods, or low intensity prescribed burns, would be important management tools for ponderosa pine forests.

3.13 Livestock Grazing

A portion of the lease parcels (21 of 49) involve only private and/or state surface ownership. Twenty-eight of the lease parcels, in whole or part, have BLM or BOR surface ownership. All but twenty-five of the lease parcels has a BLM grazing authorization. The forty-nine parcels involve nine grazing allotments in five different counties. Of the nine grazing allotments, all are authorized for cattle grazing only. Four of the grazing authorizations do not restrict the grazing season of use due to the small percentage of public land within the allotment. The other five have a restricted season of use. One allotment grazes according to a developed allotment management plan (AMP). Most allotments have several range improvements such as fences, stock ponds, pipelines, springs, windmills, seedings, wells, and access roads for livestock management purposes.

3.14 Recreation and Travel Management

BLM only manages recreational opportunities and experiences on BLM-administered surface. The affected environment consists of approximately 10,786 acres of BLM-administered surface. Recreational activities enjoyed by the public on BLM lands within the analysis area include hunting, hiking, camping, fishing, photography, 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.

Of the 10,786 BLM-administered acres proposed for lease, approximately 230 acres (MTM 102757-PD; 192 acres and MTM-102757-YM; 38 acres) are located within the Lewis and Clark Trail Special Recreation Management Area (SRMA). Management objectives within the Lewis and Clark Trail SRMA are to enhance water-based recreation resources while meeting public demand for river access. Recreational activities in the Lewis and Clark Trail SRMA include floating, rafting, fishing, picnicking, day hiking, wildlife viewing, and camping.

Much of the approximately 10,786 BLM-administered acres proposed for lease consist of small and scattered tracts with limited legal public access (i.e., no public easements or rights-of-way across private property). The lack of public access limits use of the BLM parcels for recreational use by the general public. The types of limited public use on these lease parcels can be characterized as casual dispersed recreational activities including hiking, hunting (including outfitters), camping, and wildlife viewing.

3.15 Lands and Realty

The analysis area consists of 49 parcels that include 21,323.0373 surveyed surface acres of which 10,786.03 surveyed acres are BLM administered surface, 10,276.06 surveyed acres are private surface, 189.1073 surveyed acres are BOR surface, and 71.84 surveyed acres are state surface. Table 10 below categorizes the 49 parcels by surface ownership and county.

There are eight lease parcels with authorized BLM Rights-of Way (ROWs) approved on BLM administered surface (Appendix E).

Table 10. Number of parcels, surface ownership, and acres by county.

County	Parcels	Ownership	Acres
DANIELS			
	1 parcel (MTM-102757-4P)	Private	80.00
	1 TOTAL		80.00
GARFIELD			
	3 parcels (MTM-102757-WN, WU, WV)	Private	800.00
	3 TOTAL		800.00
MCCONE			
	1 parcel (MTM-102757-PD)	BLM	192.89
	1 parcels (MTM-102757-PE)	Private	80.00
	2 TOTAL		272.89
PRAIRIE			
	12 parcels (MTM-102757-W3, *W9, WP, WR, *WX, WY, X8, X9, XB, *XF, XJ, YA)	BLM	9,115.04
	12 parcels (MTM-102757-W4, W6, W7, W8, *W9, WQ, *WX, XA, XC, *XF, XG, YB)	Private	7,876.06
	18 TOTAL		16,991.10
RICHLAND			
	13 parcels (MTM-97300-OT, OU, OV, OW, OX, MTM-102757-Q3, Q4, Q6, Q7, V3, V4, 6D, V6)	BOR	189.11
	13 TOTAL		189.11
ROOSEVELT			
	1 parcel (MTM-102757-YM)	BLM	38.10
	1 parcel (MTM-102757-4R)	State	71.84
	2 TOTAL		109.94
ROSEBUD			

	4 parcels (MTM-102757-43, 46, 47, 49)	BLM	1,440.00
	3 parcels (MTM-102757-44, 48, 4Y)	Private	1,440.00
	7 TOTAL		2,880.00

*3 parcels contain both federal and private surface.

All 13 Parcels (MTM-97300-OT, OU, OV, OW, OX, MTM-102757-Q3, Q4, Q6, Q7, V3, V4, 6D, V6) in Richland County, which were Acquired by the Bureau of Reclamation (BOR), are within the boundaries of the Withdrawal created by the Secretarial Order of August 24, 1903, for the Yellowstone River Project, except for of small portion of two parcels (MTM-102757-Q3 in the NESE, Section 9, T23N, R59E and MTM-97300-OX in the NENW, Section 29, T23N, R59E). This withdrawal would not affect patented lands or federal leasable minerals. The withdrawn lands were withdrawn from settlement, entry or other form of disposal under the public land laws, except the homestead laws and remained open to the leasing laws

3.16 Minerals

3.16.1 Fluid Minerals

It is the policy of the BLM to make mineral resources available for development 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.

Currently there are 1,410 federal oil and gas leases covering approximately 1,076,113 acres in the MCFO. The number of acres leased and the number of leases can vary on daily basis as leases are relinquished, expired, or are terminated. Existing production activity occurs on approximately 25.6 {275,426 acres} percent of this lease acreage. Information on numbers and status of wells on these leases and well status and numbers of private and state wells within the external boundary of the field office is displayed in Table 11. Numbers of townships, leases acres within those townships, and development activity for all jurisdictions are summarized in Table 12.

Exploration and development activities would only occur after a lease is issued and the appropriate permit is approved. Exploration and development proposals would require completion of a separate environmental document to analyze specific proposals and site-specific resource concerns before BLM approved the appropriate permit.

Table 11. Existing Development Activity

	FEDERAL WELLS	PRIVATE AND STATE WELLS
Drilling Well(s)	23	163
Producing Gas Well(s)(including CBNG)	494	1374
Producing Oil Well(s)	333	1966
Water Injection Well(s)	74	130
Shut-in Well(s)	58	439
Temporarily Abandoned Well(s)	123	426

Table 12. Oil and Gas Leasing and Existing Development within Townships Containing Parcels

	McCone County	Richland County	Prairie County	Daniels County
Number of Townships Containing Lease Parcels	1	4	8	1
Total Acres Within Applicable Township(s)	23,679	92,038	92,060	22,973
Acres of Federal Oil and Gas Minerals	1,930	4,621	19,465	120
Percent of Township(s)	8.2%	5.0%	21.1%	0.52%
Acres of Leased Federal Oil and Gas Minerals	Zero	3350	Zero	Zero
Percent of Township(s)	0.0%	3.6%	0.0%	0.0%
Acres of Leased Federal Oil and Gas Minerals Suspended	Zero	Zero	Zero	Zero
Percent of Township(s)	0.0%	0.0%	0.0%	0.0%
Federal Wells	No Drilling, producing, shut in, or TA wells.	2 P&A wells, 1 POW	No Drilling, producing, shut in, or TA wells.	No Drilling, producing, shut in, or TA wells.
Private and State Wells	No Drilling, producing, shut in, or TA wells.	2 abandoned Converted to H2O injection, 1 Deviated Oil Well w/ Multiple Completion, 7 Horizontal Oil Well, 7 Multiple completion Oil well, 4 Shut Ins, 52 P&A, 32 POW, 4 service wells, 1 temporarily Abandoned well	No Drilling, producing, shut in, or TA wells.	3 P&A wells

Table 12. Oil and Gas Leasing and Existing Development within Townships Containing Parcels

	Roosevelt County	Rosebud County	Garfield County
Number of Townships Containing Lease Parcels	3	3	2
Total Acres Within Applicable Township(s)	57,378	69,109	46,083
Acres of Federal Oil and Gas Minerals	5,086	6,537	877
Percent of Township(s)	8.9%	9.5%	1.9%
Acres of Leased Federal Oil and Gas Minerals	2,522	241	Zero

	Roosevelt County	Rosebud County	Garfield County
Percent of Township(s)	4.4%	0.3%	0.0%
Acres of Leased Federal Oil and Gas Minerals Suspended	Zero	Zero	Zero
Percent of Township(s)	0.0%	0.0%	0.0%
Federal Wells	1 P&A	No Drilling, producing, shut in, or TA wells.	No Drilling, producing, shut in, or TA wells.
Private and State Wells	12 P&A, 7 POW, 6 HOW [Horizontal Oil Well], 1 HOW Temporarily Abandoned, 1 Multiple Completion Oil Well	No Drilling, producing, shut in, or TA wells.	No Drilling, producing, shut in, or TA wells.

3.17 Special Designations

3.17.1 National Historic/Scenic Trails

Lease parcels MTM 102757-PD and YM (approximately 230 acres) are within the Lewis and Clark National Historic Trail (NHT). The Lewis and Clark NHT will continue to be managed in accordance with the Act that established the trail in 1978. It will be managed for public use and enjoyment, while preserving the historic and cultural resources that are related to the events that occurred during the Lewis and Clark Expedition. Any changes in the landscape within view of the Lewis and Clark NHT will be guided by Class II visual resource management objectives.

3.18 Social and Economic Conditions

3.18.1 Social and Environmental Justice

The social section focuses on the areas in the immediate vicinity of the parcels proposed for leasing. This area includes seven counties in eastern Montana: Daniels, Garfield, McCone, Prairie, Richland, Roosevelt, and Rosebud 80% of acres examined for leasing located in Prairie County. In 2010 this seven county region was reported to have a population of 35,274 people, with more than 80% of the region's population living within Richland (10,425), Roosevelt (9,746), and Rosebud (9,233) Counties. Smaller Populations were reported in Daniels (1,751), Garfield (1,206), McCone (1,734), and Prairie (1,179) Counties (U.S. Census, 2010). Census data indicated that populations within this region declined between 2000 and 2010. Although all seven counties reported population losses during this time period, losses in Daniels (13.2%), Garfield (5.7%) and McCone (12.3%) counties were substantially greater than those in Prairie (1.7%), Richland (0.8%), Roosevelt (1.8%), and Rosebud (1.6%) (US Department of Commerce, 2012). While Montana is often characterized as a rural state with a population density of 6.8 persons per square mile, all of the seven counties with land proposed for oil and gas leasing were reported to have fewer than 6.8 persons per square mile in 2010. Of these seven counties, only Daniels (1.2), Richland (4.7), Roosevelt (4.4), and Rosebud (1.8) had population densities greater than 1. The county seats for these counties include Scobey in Daniels County (1,107), Jordan in Garfield County (352), Circle in McCone County (526), Terry in Prairie County (605), Sidney in Richland County (4,843), Wolf Point in Roosevelt County (2,621), and Forsyth in Rosebud County (1,777) (U.S. Census, 2010).

Currently oil and gas leasing and production are taking place on public and private lands within these seven counties. Approximately half of the acres being considered for this lease sale are under BLM ownership, with an addition 2,876 acres under split ownership between BLM and private estates. Interest in oil and gas development in this region has significantly increased over the last five years because of its proximity to the Bakken formation which extends from the Williston Basin in western North Dakota to northeastern Montana. Richland, MT, which is adjacent to the Williston Basin, has had the highest oil and gas production on federal lands of any of county in eastern Montana. Most of the oil and gas industry support services for eastern Montana occur in Glendive, Sidney, and Miles City, Montana, and Williston and Dickinson, North Dakota.

According to the 2010 Census populations in the seven counties with land proposed for oil and gas leasing were made up of individuals who identified with one of three racial groups: White alone, American Indian alone, or of Two or more races. While 70% of the total population in this seven-county region identified themselves as White alone, individuals identifying themselves as White accounted for more than 95% of the total population in five of the seven counties (Daniels, Garfield, McCone, Prairie, and Richland) (U.S. Department of Commerce, 2012). Populations in Roosevelt and Rosebud counties were more diverse in 2010 with large American Indian populations from the Cheyenne and Sioux tribes. Roosevelt and Rosebud counties 2010 populations were made up of 37% and 61% White alone, 49% and 33% American Indian alone, and 13% and 3% Two or more races (U.S. Department of Commerce, 2012). While the percent of Montana residents (14.5%) living below the poverty line in 2010 was comparable to the nation poverty rate (13.8%), the poverty rate of the seven-county region in eastern Montana (17%) was above state and national levels. The relatively high regional poverty rate was driven by poverty levels in Prairie (16.9%), Roosevelt (21.5%), and Rosebud (18.5%) counties; while poverty in Daniels (14.1%), Garfield (10.7%), McCone (8.6), and Richland (13.5%) counties remained relatively low in 2010 (U.S. Department of Commerce, 2012).

The social environment of these counties is described in detail in the Socioeconomic Baseline Report for the Miles City Field Office RMP and EIS (prepared for the DOI, BLM, MCFO, June, 2005).

3.18.2 Economics

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. While this lease sale considers parcels in seven counties in eastern Montana, the affected local economy is made up of ten counties in Montana (Custer, Daniels, Dawson, Garfield, McCone, Prairie, Richland, Roosevelt, Rosebud, and Williams, ND). Williams County, North Dakota is included in this analysis because Williston, ND is a business center for the area, especially for oil and gas related industries.

The 10-county local economy had an estimated 2010 population of about 75,670 people. Total employment was estimated to be 57,952 jobs; there were an estimated 30,579 households; there were 187 industrial sectors represented in the local economy; average income per household was

\$110,649; and total personal income was an estimated \$3.38 billion (IMPLAN, 2010). Williston, ND (population about 14,700 in 2010) is the largest population and business center in the area, followed by Miles City, MT with a 2010 population of 8,410 (U.S. Census Bureau, 2010). There were 1.31 people per job within the local economy and 0.53 households per job (IMPLAN, 2010).

Over the 5-year period between 2007 and 2011, most of the oil and gas drilling and production within the seven counties where leases are proposed (Daniels, Garfield, McCone, Prairie, Richland, Roosevelt, and Rosebud counties) occurred in Richland County. During this 5-year period, Richland averaged 56.0 new wells per year, Roosevelt averaged 12.0, Rosebud averaged 3.6, Garfield averaged 1.2, and the remaining three counties averaged less than 1 new well per year... Eighty-nine percent of these wells were oil wells, 5 percent were dry holes, and about 4 percent were gas wells (MT DNR, Oil and Gas Conservation Commission, 2012). Statewide average wellhead prices in 2009 were \$52.96 per bbl. for crude oil and \$3.16 per MCF for natural gas (IPAA, 2010). The estimated average cost of drilling and equipping an oil well in the Bakken formation was \$13,887,020 and \$8,688,205 for dry holes in 2009 (IPAA, 2010).

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

In September, 2012, there were 325,981.14 acres of BLM federal minerals leased for oil and gas in the seven counties with proposed parcels, of these acres, 41,109.68 acres were held by production in Garfield, Prairie, Richland, Roosevelt, and Rosebud counties. Annual lease rental is paid on the 284,871.46 acres which are not held by production. Total annual lease bonus and rental revenues to the federal government from leasing federal minerals average an estimated \$498 thousand. Lease rents are not paid on acres that are 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 bonus bid as well as annual rents. The minimum competitive lease bid is \$2.00 per acre. If parcels do not receive the minimum bid they may be leased later as noncompetitive leases that don't generate bonus bids. Within the seven counties with lease parcels, the weighted average bonus bid was \$20.66 per acre on federal leases issued in fiscal year 2012. Average bonus per leased acre ranged from \$2.00 in Garfield County to \$1,850.00 in Roosevelt County.

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. During the lease period annual lease rents continue until one or more wells are drilled that result in production and associated royalties. Within the seven counties with lease parcels, 41,109.68 acres of federal minerals are held by production.

Forty-nine percent of these federal leasing revenues from public domain minerals are distributed to the state and the state distributes 25 percent of the revenue it receives back to the counties where the leases exist. About 95 percent of the leased federal minerals within the Miles City

Field Office are leased on public domain minerals. With federally acquired minerals (acquired under Bankhead Jones authority), 25 percent of federal revenues are distributed directly to the appropriate counties. The federal government collects an estimated annual average of about \$498 thousand in federal lease bonus bids and rent within the seven counties with lease parcels. An estimated \$238 thousand is distributed to the state/local governments.

The seven counties with parcels proposed leases focus primarily on crude oil extraction. In 2010 these seven counties produced 560,172 barrels of oil and 0 MCF of natural gas. Since federal minerals are not evenly distributed across these counties, oil production will vary within and across regions.

Federal oil and gas production in Montana is subject to production taxes or royalties. The federal oil and gas royalties on production from public domain minerals equal 12.5 percent of the value of production (43 CFR 3103.3.1). Forty-nine percent of these royalties from public domain minerals are distributed to the state, of which 25 percent is distributed back to the county of production (Title 17-3-240, MCA). If production comes from acquired federal minerals under the Bankhead Jones authority, 25 percent of the federal revenues are distributed directly to the counties of production.

Local economic contributions of leasing, exploring, and developing federal minerals:
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 and rent 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. Extraction of 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 6,139 total jobs and \$520.46 million in total employee compensation and proprietor income in the 10-county local economy (IMPLAN, 2010).

Currently 325,981 acres of federal minerals are leased within the seven counties with lease parcels. Total federal revenues from federal oil and gas leasing, rents, and royalty payments within these counties containing proposed lease parcels averaged an estimated \$4.2 million in 2011. Federal revenues disbursed to the state of Montana averaged an estimated \$2.01 million per year. The local counties of production received an estimated combined average \$542,610 per year. These revenues help fund traditional county functions such as enforcing laws, administering justice, collecting and disbursing tax funds, providing for orderly elections, maintaining roads and highways, providing fire protection, and/or keeping records. Other county functions that may be funded include administering primary and secondary education and operating clinics/hospitals, county libraries, county airports, local landfills, and county health systems.

The estimated annual local economic contribution associated with BLM-managed federal leases, rents, drilling, production, and royalty payments combined to support a total of 410 local jobs (full and part-time) and about \$29.3 million in local labor income, respectively within the ten

county local economy. This amounts to about 0.71 percent of the local employment and 1.13 percent of local labor and proprietor's income. Table 13 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 seven counties that make up the local economy.

Table 13. Current Contributions of Federal Oil and Gas Leasing, Exploration, Development, and Production to the 10-County Local Economy

Industry	Employment (Jobs)		Labor Income (Thousands of 2011 dollars)	
	Area Totals	BLM O&G- Related	Area Totals	BLM O&G- Related
Agriculture	6,396	0	\$80,267	\$4
Mining	6,817	251	\$592,485	\$23,336
Utilities	637	1	\$83,013	\$140
Construction	3,159	1	\$176,026	\$58
Manufacturing	923	0	\$40,294	\$17
Wholesale Trade	2,289	10	\$159,482	\$730
Transportation & Warehousing	2,478	8	\$189,009	\$570
Retail Trade	5,270	26	\$142,106	\$664
Information	663	3	\$30,227	\$122
Finance & Insurance	2,377	13	\$90,829	\$487
Real Estate & Rental & Leasing	1,509	7	\$60,299	\$250
Prof, Scientific, & Tech Services	1,489	11	\$84,441	\$692
Mngt of Companies	76	1	\$5,752	\$65
Admin, Waste Mngt & Rem Serv	1,349	5	\$26,872	\$85
Educational Services	665	2	\$20,998	\$50
Health Care & Social Assistance	5,435	28	\$209,257	\$1,048
Arts, Entertainment, and Rec	979	3	\$13,624	\$46
Accommodation & Food Services	3,351	17	\$50,407	\$248
Other Services	2,710	12	\$81,622	\$289
Government	9,382	9	\$466,539	\$419
Total Contributions of BLM O&G	57,952	410	2,603,547	29,322
Percent of Total	---	0.71%	---	1.13%

IMPLAN, 2010 database

4.0 ENVIRONMENTAL IMPACTS

4.1 Assumptions and Reasonably Foreseeable Development Scenario 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 lease parcels are leased, it remains unknown whether development would actually occur, and if so, where specific wells would be drilled and where facilities would be placed. This would not be determined until the BLM receives an APD in which detailed information about proposed wells and facilities would be provided for particular leases. 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 BMPs documented in “Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development” (USDI and USDA 2007), also known as the “Gold Book.” The BLM could also identify APD COAs, 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.

For split-estate leases, the BLM would notify the private landowners that oil and gas exploration or development activities are proposed on their lands and they are encouraged to attend the onsite inspection to discuss the proposed activities. In the event of activity on such split estate leases, 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.

Environmental consequences are discussed below by alternative to the extent possible at this time for the resources described in Chapter 3. 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 are identified by resource below.

4.1.1 Reasonably Foreseeable Development Scenario Summary

The RFD for this EA (Appendix C) is based on information contained in the RFD developed in 2005 and revised in 2012 for the MCFO RMP. The RFD prepared for the MCFO RMP contains the number of possible oil and gas wells that could be drilled and produced in the MCFO area and used to analyze the possible number of well drilled for the 49 nominated lease parcels. These well numbers are only an estimate based on historical drilling and geologic data. A detailed description of the RFD forecast for this EA is found in Appendix C.

4.1.2 Alternative B and C Assumptions

The following assumptions are from the RFD developed for the MCFO RMP. The RFD forecasts the following level of development in the MCFO area.

No surface disturbance would occur as a result of issuing leases. For analysis purposes, the potential number of acres disturbed by exploration and development activities is shown in Tables D-1 in Appendix D. The potential acres of disturbance reflect acres typically disturbed by construction, drilling, and production activities, including infrastructure installation throughout the MCFO. Typical exploration and development activities and associated acres of disturbance were used as assumptions for analysis purposes in this EA. (Note: The assumptions were not applied to Alternative A because the lease parcels would not be offered for lease; therefore, no wells would be drilled or produced on the lease parcel, and no surface disturbance would occur on those lands from exploration and development activities).

4.2 Alternative A (No Action Alternative)

4.2.1 Direct Effects Common to All Resources, not including Economics

Under Alternative A, the 49 parcels, 21,323.0373 surveyed federal mineral acres (10,786.03 surveyed BLM administered surface, 189.1073 BOR surface, and 10,347.90 surveyed private/state surface), would not be offered for competitive oil and gas lease sale. Under this alternative, the state and private minerals could still be leased in surrounding areas. Surface management would remain the same and ongoing oil and gas development would continue on surrounding federal, private, and state leases.

There would not be new impacts from oil and gas exploration or production activities on the federal lease 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 from the parcel lands. The No Action Alternative would result in the continuation of the current land and resource uses on the lease parcels.

Except for Economic resources, described below, no further analysis of the No Action Alternative is presented for resources on parcel lands.

4.2.2 Economics

4.2.2.1 Direct and Indirect Effects:

The basis for economic impacts is the number of acres leased, rents paid, and level of production by alternative. 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 and rent of federal minerals, 2) 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.

Economic effects are summarized and displayed in comparative form in Table 14. Under Alternative A, none of the parcels would be leased. Consequently, no federal, state, or local revenues could be generated from leasing, rents, or royalties associated with production. No employment or income could be generated if none of the parcels are leased.

Table 14. Summary Comparison of Estimated Average Annual Economic Impacts

Alternative	Acres Leased	Change in Local Revenue to Counties	Change in Total Employment (full and part-time jobs)	Total Labor Income (\$1,000)	Change in Population	Change in Number of Households
A	0	0	0	0	0	0
B	21,288	\$41,680	26	\$1,876	34	14
C	18,408	\$36,041	22	\$1,623	29	12

These impacts would be in addition to impacts from existing federal leases, rents, royalties and related activities

4.2.2.2 Cumulative Effects:

Cumulative economic impacts associated with Alternative A would be similar to those described in the economic section of the Affected Environment. The cumulative effects of federal mineral leasing, exploration, development and production within the local economy are summarized in Table 15 and Table 16. The cumulative demographic and economic characteristics of the local economy could not change if none of the proposed parcels are leased.

Table 15. Summary Comparison of Cumulative Annual Economic Impacts by Alternative

Activity	Alternative		
	A	B	C
Existing Acres leased*	325,981	325,981	325,981
Acres that would be leased based on this EA **	0	21,288	18,408
Total acres leased	325,981	347,269	344,389
Acres held by production*	41,110	41,110	41,110
Total acres leased for which lease rents would be paid	284,871	306,160	303,280
Total average annual federal lease and rental revenue	\$498,525	\$579,764	\$568,774
Average annual distribution to State/local government	\$238,295	\$277,127	\$271,874
Average annual oil production (bbl)***	560,172	596,754	591,805
Average annual gas production (MCF)***	0	0	0
Total Average annual Federal O&G royalties	\$3,708,339	\$3,950,511	\$3,917,749
Average annual distribution to State/local government	\$1,772,586	\$1,888,344	\$1,872,684
Total average annual Federal Revenues	\$4,206,864	\$4,530,276	\$4,486,523
Total average annual State/Local Revenues	\$2,010,881	\$2,165,472	\$2,144,558
Total average annual revenue distributed to counties	\$542,160	\$583,839	\$578,201
*LR2000, BLM, March 2012			
**RFD, BLM, October 5, 2012			
***Based on average annual production 2005-2010, Office of Natural Resource Revenue, 2011			

Table 16. Summary Comparison of Employment and Income by Alternative

Industry	Total Jobs Contributed			Total Income Contributed (\$1000)		
	Alt. A	Alt. B	Alt. C	Alt. A	Alt. B	Alt. C
Total Contribution	410	438	433	29,322	31,346	30,970

IMPLAN, 2010 database

4.3 Alternative B (Proposed Action)

Under Alternative B, the 49 parcels, 21,323.0373 surveyed federal mineral acres (10,786.03 surveyed BLM administered surface, 189.1073 BOR surface, and 10,347.90 surveyed private/state surface), would be offered for competitive oil and gas lease sale. No parcels would be deferred.

4.3.1 Direct Effects Common to All Resources

The action of leasing the parcels in Alternative B would, in and of itself, has no direct impact on resources. Any potential effects on resources from the sale of leases would occur during lease exploration and development activities. At the time of this review it is unknown whether a particular lease parcel would be sold and a lease issued.

4.3.2 Indirect Effects Common to All Resources

Oil and gas exploration and development activities such as construction, drilling, production, infrastructure installation, vehicle traffic and reclamation are indirect effects from leasing the lease parcels in Alternative B. It is unknown when, where, how, or if future surface disturbing activities associated with oil and gas exploration and development such as well sites, roads, facilities, and associated infrastructure would be proposed. It is also not known how many wells, if any, would be drilled and/or completed, the types of technologies and equipment would be used and the types of infrastructure needed for production of oil and gas. Thus, the types, magnitude and duration of potential impacts cannot be precisely quantified at this time, and would vary according to many factors. The potential impacts from exploration and development activities would be analyzed after receipt of an APD or sundry notice.

Typical impacts to resources from oil and gas exploration and development activities such as well sites, roads, facilities, and associated infrastructure are described in the Miles City Oil & Gas Amendment/EIS (1994), the Big Dry RMP (1996), the Montana Statewide Oil & Gas Amendment/EIS (2003) and the Supplement (2008) to that document.

4.3.3 Air Resources

4.3.3.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on air quality. Any potential effects from sale of lease parcels could occur at the time the leases are 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, as well as potential releases of GHGs and VOCs 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, as well as the scope of specific activities proposed in an APD.

Current monitoring data show that criteria pollutants concentrations are below applicable air quality standards, indicating good air quality. The potential level of development and mitigation described below is expected to maintain this level of air quality by limiting emissions. In addition, 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.

4.3.3.1.2 Greenhouse Gas Emissions at the MCFO and Project Scales

Sources of GHGs associated with development of lease parcels could 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 if the BLM receives an APD on any of the parcels considered here.

Anticipated GHG emissions presented in this section are taken from the Climate Change SIR, 2010. Data are derived from emission calculators developed by air quality specialists at the BLM National Operations Center in Denver, Colorado, based on methods described in the Climate Change SIR (2010). Based on the assumptions summarized in the SIR for the MCFO RFD, Table 17 discloses projected annual GHG source emissions from BLM-permitted activities associated with the RFD.

Table 17. BLM Projected Annual GHG Emissions Associated With Oil and Gas Exploration and Development Activity in the MCFO.

Source	BLM Long-Term GHG Emissions in tons/year				Emissions (metric tons/yr)
	CO ₂	CH ₄	N ₂ O	CO ₂ e	CO ₂ e
Conventional Natural Gas	158,154.7	1,572.8	1.2	190,984.1	173,817.6
Coal Bed Natural Gas	268,477.4	5,194.6	0.9	377,826.5	342,855.24
Oil	91,689.0	562.6	0.5	103,663.3	94,068.3
Total	518,321.1	7,330	2.6	672,473.9	610,741.1

To estimate GHG emissions associated with the action alternatives, the following approach was used:

1. The proportion of each alternative relative to the total RFD was calculated based on total acreage of parcels under consideration for leasing 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 the highest year emission output used) to estimate GHG emissions for that particular alternative.

Under Alternative B, approximately 21,323 acres of lease parcels with federal minerals would be leased. These acres constitute approximately 0.4 percent of the total federal mineral estate of approximately 5,798,000 acres identified in the MCFO RFD. Therefore, based on the approach

described above to estimate GHG emissions, 0.4 percent of the RFD for this EA total estimated BLM emissions of approximately 610,741 metric tons/year would be approximately 2,443 metric tons/year of CO₂e if the parcels within Alternative B were to be developed.

4.3.3.1.3 Climate Change

The assessment of GHG emissions and climate change is in its formative phase. As summarized in the Climate Change SIR, 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 changes at small scales. On smaller scales, natural climate variability is relatively larger, making it harder to distinguish changes expected due to external forcings (such as contributions from local activities to GHGs). Uncertainties in local forcings and feedbacks 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 lease parcel development 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 emission or sequestration with the creation or mitigation of any specific climate-related environmental effects. Although the effects of GHG emissions in the global aggregate are well-documented, it is currently impossible to determine what specific effect GHG emissions resulting from a particular activity might have on the environment. For additional information on environmental effects typically attributed to climate change, please refer to the cumulative effects discussion below.

While it is not possible to predict effects on climate change of potential GHG emissions discussed above in the event of lease parcel development for alternatives considered in this EA, the act of leasing does not produce any GHG emissions in and of itself. Releases of GHGs could occur at the exploration/development stage.

4.3.3.2 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 would also be required as COAs 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:

- flaring or incinerating hydrocarbon gases at high temperatures to reduce emissions of incomplete combustion;
- emission control equipment of a minimum 95 percent efficiency on all condensate storage batteries;
- emission control equipment of a minimum 95 percent efficiency on dehydration units, pneumatic pumps, produced water tanks;

- vapor recovery systems where petroleum liquids are stored;
- tier II or greater, natural gas or electric drill rig engines;
- secondary controls on drill rig engines;
- no-bleed pneumatic controllers (most effective and cost effective technologies available for reducing VOCs);
- gas or electric turbines rather than internal combustions engines for compressors;
- NO_x emission controls for all new and replaced internal combustion oil and gas field engines;
- water dirt and gravel roads during periods of high use and control speed limits to reduce fugitive dust emissions;
- interim reclamation to re-vegetate areas of the pad not required for production facilities and to reduce the amount of dust from the pads.
- co-located wells and production facilities to reduce new surface disturbance;
- directional drilling and horizontal completion technologies whereby one well provides access to petroleum resources that would normally require the drilling of several vertical wellbores;
- gas-fired or electrified pump jack engines;
- velocity tubing strings;
- cleaner technologies on completion activities (i.e. green completions), and other ancillary sources;
- centralized tank batteries and multi-phase gathering systems to reduce truck traffic;
- forward looking infrared (FLIR) technology to detect fugitive emissions; and
- air monitoring for NO_x and ozone.

More specific to reducing GHG emissions, Section 6 of the Climate Change SIR identifies and describes in detail commonly used technologies to reduce methane emissions from natural gas, coal bed natural gas, and oil production operations. Technologies discussed in the Climate Change SIR and as summarized below in Table 18 (reproduced from Table 6-2 in Climate Change SIR) display common methane emission technologies reported under the EPA Natural Gas STAR Program and associated emission reduction, cost, maintenance and payback data.

Table 18. Selected Methane Emission Reductions Reported Under the USEPA Natural Gas STAR Program¹

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

Table 18. Selected Methane Emission Reductions Reported Under the USEPA Natural Gas STAR Program ¹

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)
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
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

Source: Multiple EPA 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

In the context of the oil sector, additional mitigation measures to reduce GHG emissions include methane reinjection and CO₂ injection. These measures are discussed in more detail in Section 6.0 of the Climate Change SIR (2010).

In an effort to disclose potential future GHG emission reductions that might be feasible, the BLM estimated GHG emission reductions based on the RFD for the MCFO. For emission

sources subject to BLM (federal) jurisdiction, the estimated emission reductions represent approximately 51 percent reduction in total GHG emissions compared to the estimated MCFO federal GHG emission inventory (Climate Change SIR, as updated October 2010, Section 6.5 and Table 6-3). The emission reductions technologies and practices are identified as mitigation measures that could be imposed during development. Furthermore, the EPA is expected to promulgate new federal air quality regulations that would require GHG emission reductions from many oil and gas sources.

4.3.4 Soil Resources

4.3.4.1 Direct and Indirect Effects

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

Land uses associated with oil and gas exploration and development could cause surface disturbances. Such acts result in reduced ground cover, soil mixing, compaction, or removal, exposing soils to accelerated erosion by wind and water, resulting in the irretrievable loss of topsoil and nutrients and potentially resulting in mass movement or sedimentation. Surface disturbances also change soil structure, heterogeneity (variable characteristics), temperature regimes, nutrient cycling, biotic richness, and diversity. Along with this, mixed soils have decreased bulk density, and altered porosity, infiltration, air-water relationships, salt content, and pH (Perrow and Davy, 2003; Bainbridge 2007). Soil compaction results in increased bulk density, and reduced porosity, infiltration, moisture, air, nutrient cycling, productivity, and biotic activity (Logan 2001; 2003; 2007). Altering such characteristics reduces the soil system's ability to withstand future disturbances (e.g., wildfire, drought, high precipitation events, etc.).

The probability and magnitude of these effects are dependent upon local site characteristics, climatic events, and the specific mitigation applied to the project. Within 2-5 years following reclamation, vegetative cover and rates of erosion would return to pre-disturbance conditions (USDI BLM 2008). Exceptions would be sites poorly suited to reclamation, which could require unconventional and/or site-specific reclamation measures.

4.3.4.2 Mitigation

Measures would be taken to reduce, avoid, or minimize potential impacts to soil resources from exploration and development activities. Prior to authorization, proposed actions would be evaluated on a case-by-case basis and would be subject to mitigation measures in order to maintain the soil system. Mitigation would include avoiding areas poorly suited to reclamation, limiting the total area of disturbance, rapid reclamation, erosion/sediment control, soil salvage, decompaction, revegetation, weed control, slope stabilization, surface roughening, and fencing.

4.3.5 Water Resources

4.3.5.1 Direct and Indirect Effects

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

The magnitude of the impacts to water resources would be dependent on the specific activity, season, proximity to waterbodies, location in the watershed, upland and riparian vegetation

condition, effectiveness of mitigation, and the time until reclamation success. Surface disturbance effects typically are localized, short-term, and occur from implementation through vegetation reestablishment. As acres of surface-disturbance increase within a watershed, so could the effects on water resources.

Oil and gas exploration and development of a lease parcel could cause the removal of vegetation, soil compaction, and soil disturbance in uplands within the watershed, 100-year floodplains of non-major streams, and non-riparian, ephemeral waterbodies. The potential effects from these activities could be accelerated erosion, increased overland flow, decreased infiltration, increased water temperature, channelization, and water quality degradation associated with increased sedimentation, turbidity, nutrients, metals, and other pollutants. Erosion potential can be further increased in the long term by soil compaction and low permeability surfacing (e.g. roads and well pads) which increases the energy and amount of overland flow and decreases infiltration, which in turn changes flow characteristics, reduces groundwater recharge, and increases sedimentation and erosion (DEQ 2007).

Spills or produced fluids could potentially impact surface and ground water resources in the long term. Oil and gas exploration/development could contaminate aquifers with salts, drilling fluids, fluids and gases from other formations, detergents, solvents, hydrocarbons, metals, and nutrients; change vertical and horizontal aquifer permeability; and increase hydrologic communication with adjacent aquifers (EPA 2004). Groundwater removal could result in a depletion of flow in nearby streams and springs if the aquifer is hydraulically connected to such features. Typically produced water from conventional oil and gas wells is from a depth below useable aquifers or coal seams (FSEIS 2008).

4.3.5.2 Mitigation

Stipulations addressing steep slopes, waterbodies, streams, 100-year floodplains of major rivers, riparian areas, and wetlands would minimize potential impacts and would be included with the lease when necessary (Appendix A). In the event of exploration or development, measures would be taken to reduce, avoid, or minimize potential impacts to water resources including application of appropriate mitigation. Mitigation measures that minimize the total area of disturbance, control wind and water erosion, reduce soil compaction, maintain vegetative cover, control nonnative species, and expedite rapid reclamation (including interim reclamation) would maintain water resources.

Methods to reduce erosion and sedimentation could include: reducing surface disturbance acres; installing and maintaining adequate erosion control; proper road design, road surfacing, and culvert design; road/infrastructure maintenance; use of low water crossings; and use of isolated or bore crossing methods for waterbodies and floodplains. In addition, applying mitigation to maintain adequate, undisturbed, vegetated buffer zones around waterbodies and floodplains could reduce sedimentation and maintain water quality. Appropriate well completion, the use of Spill Prevention Plans, and Underground Injection Control regulations would mitigate groundwater impacts. Site-specific mitigation and reclamation measures would be described in the COAs.

4.3.6 Vegetation Resources

4.3.6.1 Direct and Indirect Effects

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

Impacts to vegetation depend on the vegetation type/community, soil community and the topography of the lease parcels. Disturbance to vegetation is of concern because protection of soil resources, maintenance of water quality, conservation of wildlife habitat, and livestock production capabilities could be diminished or lost over the long-term through direct loss of vegetation (including direct loss of both plant communities and specific plant species).

Other direct impacts, such as invasive species invasion, could result in loss of desirable vegetation. Invasive species and noxious weeds could also reduce livestock grazing forage, wildlife habitat quality, and native species diversity. In addition, invasive species are well known for changing fire regimes.

Additionally, surface disturbing activities directly affect vegetation by destroying habitat, churning soils, impacting biological crusts, disrupting seedbanks, burying individual plants, and generating sites for competitive species. In addition, other vegetation impacts could also be caused from soil erosion and result in loss of the supporting substrate for plants, or from soil compaction resulting in reduced germination rates. Impacts to plants occurring after seed germination but prior to seed set could be particularly harmful as both current and future generations would be affected.

Fugitive dust generated by construction activities and travel along dirt roads could affect nearby plants by depressing photosynthesis, disrupting pollination, and reducing reproductive success. Oil, fuel, wastewater or other chemical spills could contaminate soils as to render them temporarily unsuitable for plant growth until cleanup measures were fully implemented. If cleanup measures were less successful, longer term vegetation damage could be expected.

Oil and gas development activity could reduce B M's ability to manage livestock grazing while meeting or progressing towards meeting the Standards of Rangeland Health. Development and associated disturbances could reduce available forage or alter livestock distribution leading to overgrazing or other localized excess grazing impacts. Construction of roads, especially in areas of rough topography could cause significant changes in livestock movement and fragment suitable habitat for some plant communities.

If development activity is reducing vegetative resources for livestock grazing and the grazing activity is resulting in the allotment not meeting the standards for rangeland health, then the authorized officer would have to take action prior to the next grazing season to ensure the BLM lands are progressing towards meeting the standards. This could result in the change of livestock grazing activities in order to improve vegetative conditions.

4.3.6.2 Mitigation

Mitigation would be addressed at the site specific APD stage of exploration and development. If needed, COAs would potentially include, but not limited to, revegetation with desirable plant

species, soil enhancement practices, direct live haul of soil material for seed bank revegetation, reduction of livestock grazing, fencing of reclaimed areas, and the use of seeding strategies consisting of native grasses, forbs, and shrubs.

4.3.7 Riparian-Wetland Habitats

4.3.7.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on riparian-wetland habitats. Any potential effects from sale of lease parcels could occur at the time the leases are developed.

The exploration and development of oil and gas within uplands or adjacent to riparian-wetland areas could reduce riparian/wetland functionality by changing native plant productivity, composition, richness, and diversity; accelerating erosion; increasing sedimentation; and changing hydrologic characteristics. Impacts that reduce the functioning condition of riparian and wetland areas could impair the ability of riparian/wetland areas to reduce nonpoint source pollution (MDEQ 2007) and provide other ecosystem benefits. The magnitude of these effects would be dependent on the specific activity, season, proximity to riparian-wetland areas, location in the watershed, upland and riparian-wetland vegetation condition, mitigation applied, and the time until reclamation success. Erosion increases typically are localized, short term, and occur from implementation through vegetation reestablishment. As acres of surface-disturbance increase within a watershed, so could the effects on riparian-wetland resources.

4.3.7.2 Mitigation

Stipulations addressing steep slopes, waterbodies, streams, 100-year floodplains of major rivers, and riparian areas would minimize potential impacts and would be included with the lease when necessary (Appendix A). In the event of exploration or development, site-specific mitigation measures would be identified which would avoid or minimize potential impacts to riparian-wetland areas at the APD stage. Mitigation measures that minimize the total area of disturbance, control wind and water erosion, reduce soil compaction, maintain vegetative cover, control nonnative species, maintain biodiversity, maintain vegetated buffer zones, and expedite rapid reclamation (including interim reclamation) would maintain riparian/wetland resources.

4.3.8 Special Status Plant Species

4.3.8.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on special status plant species. Any potential effects from the sale of leases could occur at the time the leases are developed.

4.3.8.2 Mitigation

Stipulations applied to wildlife resources, steep slopes, waterbodies, streams, 100-year floodplains of major rivers, riparian areas, and wetlands would likely also provide protections for special status plant species. Proposed development would be analyzed on a site-specific basis prior to approval of oil and gas exploration or development activities at the APD stage. Mitigation would also be addressed at the site-specific APD stage. Surveys to determine the existence of federally listed species could occur on BLM-administered surface or minerals prior to approval of exploration and development activities at the APD stage.

4.3.9 Wildlife

4.3.9.1 Direct and Indirect Effects

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

The use of standard lease terms and stipulations on these lands (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 would 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 tolerance of the specific 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.

4.3.8.1.1 Threatened, Endangered, and Candidate Species

Habitat within the lease parcels exists to support USFWS threatened, endangered, or candidate species including the whooping crane, interior least tern, piping plover, pallid sturgeon, Sprague's pipit, and sage grouse.

BLM has determined that the act of issuing leases within the whooping crane migration corridor will not affect the whooping crane. However, impacts to whooping cranes are possible from subsequent oil and gas development activities permitted at the APD stage. At this time, stipulations do not currently exist to protect any known whooping crane migration staging areas. Line strikes, collisions with vehicles, habitat fragmentation, and other anthropogenic activities could disturb, displace, or cause direct mortality of whooping cranes.

Therefore, if development on any of the leases within the whooping crane migration corridor is proposed within suitable whooping crane staging, stopover or roosting habitat, BLM would consult with the USFWS pursuant to section 7(a)(2) of ESA. An outcome of the consultation process could be that conditions of approval are attached to the permit or the permit could not be approved. Other BMP's could also be developed through consultation, including minimizing disturbance, adherence to Avian Powerline Interaction Committee (APLIC) guidelines, and others as deemed appropriate.

Several lease parcels are located adjacent to Interior least tern nesting habitat along the Missouri and Yellowstone River corridors. Existing stipulations from the Big Dry RMP (1995) requires a NSO stipulation within 0.25 miles of wetlands identified as interior least tern habitat. As a result of these stipulations, development would not impact nesting habitat, and issuing the proposed lease parcels would have no affect on interior least terns.

Several lease parcels are located adjacent to piping plover nesting habitat along the Missouri River corridor, and within the Unit 2 critical habitat designation for piping plovers. Existing

stipulations from the Big Dry RMP (1995) requires a NSO stipulation within 0.25 miles of wetlands identified as piping plover habitat. As a result of these stipulations, issuing the proposed lease parcels would have no affect on piping plovers or the critical habitat Unit 2 designation.

Parcels MTM 102757-47, 48, 49 are located within an area that has been determined to be suitable habitat for the black-footed ferret. Therefore, a stipulation would be attached to parcels which would require black-footed ferret surveys to be conducted according to USFWS guidelines (1989) in the event development is proposed within an area that meets the survey criteria. Surveys conducted according to the guidelines are very effective at locating black-footed ferrets if present. If black-footed ferrets or sign are observed, BLM would consult with the USFWS pursuant to section 7(a)(2) of ESA.

Because of the low likelihood that black-footed ferrets exist outside of the reintroduction areas, the extremely low likelihood of black-footed ferret occupation of black-tailed prairie dog towns within the analysis area, and the limited habitat available, BLM has determined that the project would not affect the black-footed ferret.

Pallid sturgeon individuals and their habitat would occur in or near lease parcel MTM 102757-6D, V4, YM, PD, PE, MTM 97300-OW,OT,OU, and OV have the potential to be affected by the development of oil and gas wells. 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) could indirectly affect the pallid sturgeon species by degrading water quality and degrading or eliminating food resources. Additionally, surface disturbing activities that decrease the availability or input of organic material, large woody debris, and trees could decrease cover, food-web compartments and fluxes, and holding areas for pallid sturgeon. Other aquatic species could experience the same type of direct and indirect impacts.

Currently, in the Big Dry and Powder River RMPs there are no stipulations specific to Pallid sturgeon habitat. However, a floodplain stipulation (NSO 11-2) would not allow surface occupancy in the 100-year floodplain boundary of the Missouri and Yellowstone Rivers. Additionally, least tern stipulations (NSO 11-10) protects pallid sturgeon habitat by providing a one-quarter mile buffer along the Missouri and Yellowstone Rivers. The stipulations apply to wetlands habitat and the BLM considers the Missouri and Yellowstone Rivers as wetlands habitat for this bird species.

BLM has determined that issuing a lease for the nine parcels along the Missouri and Yellowstone Rivers will have no affect on the pallid sturgeon. If development were to occur, additional mitigation would be included as conditions of approval at the APD stage. These conditions include the placement of earthen berms and oil skimmers (a culvert device placed in drainages which is intended to block oil from entering streams) to help protect pallid sturgeon habitat in

case of oil spills by greatly reducing the potential for spills to reach pallid sturgeon habitat. If oil and gas development is proposed for these nine parcels, BLM would consult with the USFWS pursuant to section 7(a)(2) of ESA.

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. Oil and gas wells, especially at high densities, decrease the amount of habitat available for breeding territories. (Federal Register: September 15, 2010 (Volume 75, Number 178))

Potential suitable habitat exists for the Sprague's pipit across the majority of the proposed lease parcels; however, inventories have not been conducted within the parcels. Therefore, inventories would be conducted at the APD stage of development to determine the presence or absence of Sprague's pipits. The Sprague's pipit lease notice, LN 14-15, is issued with those leases and would be applied if Sprague's pipits are found in the area. If Sprague's pipits are found, protective measures would be applied as conditions of approval to minimize impacts to Sprague's pipits and their habitat. In the event oil and gas development is proposed within Sprague's pipit habitat, at the APD stage BLM would conference with the USFWS pursuant to section 7(a)(4) of SA, or if the Sprague's pipit has been listed as threatened or endangered, BLM would consult with the USFWS pursuant to section 7(a)(2).

Sage grouse are offered species specific protections through a stipulation. Under Alternative B, ¼ mile NSO buffers and 2 mile timing buffers would apply where relevant. Based on research, these 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 efficacy 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.

The 2 mile timing stipulation attached to the respective parcels in this proposal only applies between March 1 to June 15, and development can occur within the 2 miles outside of those dates. Not all lease parcels would be expected to see full field development as noted in the range of RFD, although effects would most likely mirror these studies to some degree proportionate to the amount of development that occurs outside of the stipulated timeframe.

Noise has been shown to affect sage-grouse and associated sagebrush obligates. Sage-grouse are known to select highly visible leks with good acoustic properties. Effects to sage-grouse would be a decrease in numbers of males on leks and activity levels and lower nest initiation near oil and gas development. Sage-grouse numbers on leks within 1.6 km (1 mile) of coal bed natural gas compressor stations in Campbell County, Wyoming were shown to be consistently lower than on leks not affected by this disturbance (Braun et al. 2002). Holloran (2005), Holloran et. al (2005a, 2005b), and Anderson (2005) reported that lek activity by sage-grouse decreased downwind of drilling activities, suggesting that noise had measurable negative impacts on sage-grouse. The actual level of noise (measured in decibels) that would not affect greater sage-grouse breeding and nesting activities is presently unknown. Timing restriction (TL 13-3) is applied within 2 miles of leks within the MCFO, which provides some mitigation for noise level effects to sage-grouse during this timeframe.

This alternative also includes the attachment of a sage grouse lease notice (LN 14-11) when the lease parcel is located within 2 miles of a lek. The lease notice would require an operator to implement specific measures to reduce impacts of oil and gas operations on sage grouse populations and habitat quality. The application of this lease notice would be expected to reduce, but not eliminate, impacts to sage grouse and habitats.

4.3.8.1.2 Other Special Status Species

As noted, up to 48 wildlife species that B M has designated as “sensitive” have the potential to occur within the parcel areas. Stipulations are not provided for all BLM sensitive species in the current RMPs. Stipulations are provided for 7 out of the 48 “non-T &P” sensitive species. For those species afforded some protections through existing stipulations, impacts could be minimized, but not eliminated. Impacts to BLM sensitive species would be similar to those described above, unless they are afforded protective measures from other regulations such as the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703.) or the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668c). B M does not consult with the USFWS on “sensitive” species and likewise would not receive terms and conditions from USFWS requiring additional protections of those species.

Numerous species of birds were identified as potential inhabitants across the analysis area. With the impacts associated with development, it is reasonable to assume there would be impacts to nesting and migrating bird species. The primary impacts to these species would include

disturbance of preferred nesting habitats, improved habitat for undesirable competitors and/or a species shift to disturbance associated species, and increased vehicle collisions.

Research in Sublette County, Wyoming on the effects of natural gas development on sagebrush steppe passerines documented negative impacts to sagebrush obligates such as Brewer's sparrows, sage sparrows, and sage thrashers (Ingelfinger 2001). The impacts were reported greatest along roads where traffic volumes are high and within 100 meters of these roads. Sagebrush obligates were reduced within these areas by as much as 60%. Sagebrush obligate density was reduced by 50% within 100 meters of a road even when traffic volumes were less than 12 vehicles /day. It would be expected that similar population declines would occur to this guild of species from similar development proposals within sagebrush habitats.

Stipulations do not exist specifically for the protection of BLM sensitive songbirds. The MBTA prohibits the take, capture or kill of any migratory bird, any part, nest or eggs of any such bird (16 U.S.C 703 (a)). NEPA analysis pursuant to Executive Order 13186 (January 2001) requires BLM to ensure that MBTA compliance and the effects of Bureau actions and agency plans on migratory birds are evaluated, should reduce take of migratory birds and contribute to their conservation.

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 unintended direct mortality, fragmentation of habitat, change in use of habitats, and potential threats and competition from edge species. Field surveys for nesting birds at proposed development sites would be conducted for activities planned in between April 15 and July 15. Mitigation measures would be assigned at the APD stage to minimize negative effects on migratory bird populations, in compliance with Executive Order 13186 and MBTA. These mitigation measures would be required as COAs. 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 Modifications (WEM) process. BLM would coordinate WEMs with USFWS to assure MBTA compliance.

Take of bald and golden eagles and any other migratory raptors would not occur as a result of the act of leasing parcels. However, as development occurs after permits to drill are issued, there would be potential for take to occur as a result of raptor collisions with vehicles, power lines, and other development-related actions. Therefore, field surveys for raptors at proposed development sites would be conducted for activities planned between March 1 and August 1. To comply with MBTA and BGEPA, BLM would require protective measures and stipulations at the APD stage to prevent or minimize impacts to individual raptors and raptor populations, including bald and golden eagles. The protective measures would be required as COAs.

4.3.8.1.3 Other Fish and Wildlife

The types and extent of impacts to other wildlife species and habitats from development are similar to those described above for other species. Based on potential disturbing activities, direct habitat loss is possible. Initial disturbance could change the occupation of those areas to disturbance-oriented species (e.g., horned larks), or species with more tolerance for disturbances.

These changes could also be expected to decrease the diversity of wildlife. Although bladed corridors would be reclaimed after the facilities are constructed, some changes in vegetation could 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, will 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, could be most affected by this change.

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

Potential impacts to aquatic wildlife 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 aquatic wildlife species in two different ways if the spill substances enter the habitat. First, toxicological impacts from direct contact could have immediate lethal effects to eggs, larvae, juveniles, and adults. Second, toxic effects to lower food web levels (e.g. aquatic macro-invertebrates) could indirectly affect fish, amphibian, and reptile species by degrading water quality and degrading or eliminating food resources.

Additional mitigation could occur as COAs at the APD stage. These conditions could include the placement of earthen berms and oil skimmers (in ephemeral drainages where fish passage will not be blocked) to help protect aquatic wildlife habitat in case of oil spills.

Oil and gas development is allowed within big game crucial winter range with a timing restriction from December 1 to March 31. This stipulation does not apply to operation and maintenance of production facilities. The goal of this stipulation is to protect crucial big game habitats from disturbance during the winter use season. This stipulation provides protection to big game winter habitats and species only during that timeframe, and does not provide protection during the long-term operation and maintenance periods. Development can occur outside of those dates and will exist thereafter until reclamation, thus only delaying impacts until after that year of construction.

Mule deer could be impacted by this project from habitat fragmentation and disturbance. Mule deer winter range habitat has been identified within 8 lease parcels. Development could affect mule deer use of winter range habitat in those areas. Studies conducted in the Pinedale anticline of Wyoming found that mule deer avoided areas in close proximity to well pads with no evidence of well-pad acclimation during 3 out of 4 years. During year 4 of development habitat selection patterns were influenced more by road density, and not proximity of well pads. The authors attributed this to an unusually severe winter, where movement options and available habitat was limited. Densities of mule deer decreased by an estimated 46% within the developed area over the four years, and indirect impacts were observed out to 2.7-3.7 km of well sites.

Mule deer distribution shifted toward less preferred and presumably less suitable habitat. (Sawyer et al. 2005) Similar impacts could be expected from development with this proposal.

White-tailed deer could also be expected to be impacted by this project from habitat fragmentation and disturbance. Winter range for white-tailed deer exists across the analysis area, but covers much less area than other big game ranges. White-tailed deer winter range has been identified within 11 lease parcels.

Pronghorn could be impacted by this project from habitat fragmentation and disturbance. Pronghorn winter range habitat has been identified within 16 lease parcels. Preliminary studies in the upper green river basin in Wyoming report that some pronghorn exhibit movement patterns that suggest almost complete avoidance of gas field areas of intensive development in the Jonah field during the winter, whereas pronghorn in the Pinedale Anticline Project Area (PAPA) apparently have not been avoiding human activities. It is speculated that the difference may exist due to different levels in well densities, as the Jonah field was reported as 1 well/57 acres, and the PAPA at 1 well/124 acres (Berger et al. 2007). Effects to winter range within existing and future oil and gas development and exploration would be similar to those referenced above and could depend on rate and location of development.

Portions of 2 proposed lease parcels are located within 0.25 miles of sharp-tailed grouse leks. An NSO buffer within 1/4 mile of leks applies to the affected portions of the parcels. In addition, 20 lease parcels are located within 2 miles of sharp-tailed grouse leks where timing stipulations from March 1 to June 15 were applied. This timing does not apply to operation and maintenance of production facilities. Although limited research exists that documents impacts to sharp-tailed grouse from development activities, it is expected that sharp-tailed grouse could be impacted similarly to sage grouse. Sharp-tailed grouse could be impacted by this project from habitat fragmentation and disturbance. Vehicles and human activity during breeding and nesting seasons could reduce breeding activity, displace nesting hens and reduce the suitability of habitat for brood-rearing. Mortality could increase as a result of collisions with vehicles.

Wild turkeys, pheasants, and hungarian partridge could also be affected by disturbance and direct mortality through nest destruction and vehicle collisions during the development stages.

4.3.8.2 Mitigation

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

4.3.10 Cultural Resources

4.3.10.1 Direct and Indirect Effects

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

Potential effects from surface disturbances associated with exploration and development activities have the potential to alter the characteristics of a significant cultural or historic property by diminishing the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Other effects to cultural resources from proposed surface disturbance activities include the destruction, damage, or alteration to all or part of the cultural resource and diminishing the property's significant historic features as a result of the introduction of visual, atmospheric, or audible elements. This could alter or diminish the elements of a National Register eligible property and diminish the property's eligibility status. Cultural resource investigations associated with development potentially adds to our understanding of the prehistory/history of the area and discovery of sites that would otherwise remain undiscovered due to burial or omission. Indirect effects to cultural resources within the analysis area by county are as follows:

The following lease parcels have eligible site within their boundaries. They are MTM 102757-Q3, Q4, Q6, Q7, V3, V4, 6D, OX, V6, MTM 97300 OT, OU, OV, and OW. They include all of the parcels proposed for leasing within Richland County and one (PD) in McCone County.

There are 21 lease parcels (MTM 102757-XF, XG, WP, WQ, X9, X8, YA, WR, XJ, WX, WY, W3, W4, YB, W6, W8, W7, W9, XA, XB, and XC) located in Prairie County and include 16,991 acres. Based on modeling, the parcels might contain up to 88 cultural sites with 9 to 13 sites having the potential to be eligible or considered eligible for listing on the National Register of Historic Places.

Two lease parcels (MTM-102757- PD and PE) are located in McCone and include 265 acres. Based on modeling, the parcels might contain up to 2 cultural sites which could have the potential to be eligible or considered eligible for listing on the National Register of Historic Places.

Two lease parcels (MTM-102757- YM and 4R) are located in Roosevelt County and include 83 acres. Based on modeling, the parcels might contain up to 1 cultural site which could have the potential to be eligible or considered eligible for listing on the National Register of Historic Places.

One lease parcel (MTM-102757- 4P) is located in Daniels County and includes 80 acres. Based on modeling, the parcel might contain 1 cultural site which could have the potential to be eligible or considered eligible for listing on the National Register of Historic Places.

Three lease parcels (MTM-102757- WN, WU, WV) are located in Garfield County and include 800 acres. Based on modeling, the parcel might contain 2 cultural sites which could have the potential to be eligible or considered eligible for listing on the National Register of Historic Places.

Seven lease parcels (MTM 102757- 43, 44, 46, 47, 48, 49, 4Y) are located in Rosebud County and include 2880 acres. Based on modeling, the parcels might contain up to 15 cultural sites

with 1 to 2 sites having the potential to be eligible or considered eligible for listing on the National Register of Historic Places.

Leasing approximately 21,323 acres of federal minerals within the counties described above could indirectly affect, 111 cultural sites based upon modeling (Aaberg et al 2006) and the range of wells that could be drilled as described in Appendix C. Of the modeled 111 cultural sites, 12 to 17 sites may have the potential to be eligible or considered eligible for listing on the National Register of Historic Places. Seven known cultural sites are reconsidered to be eligible for listing on the National Register of Historic Places, could be directly and indirectly affected, without mitigation.

4.3.10.2 Mitigation

Application of standard lease terms, stipulations, and cultural lease notices provide mechanisms to protect vulnerable significant cultural resource values on these lease parcels (Appendix A). Lease notice LN 14-2 would be applied to 14 lease parcels (MTM 102757- Q3, Q4, Q6, Q7, V3, V4, 6D, OX V6, PD, MTM 97300 OT, OU, OV, and OW). Parcel MTM-102757-OT warranted NSO 11-11 stipulation. The cultural resource lease stipulation CR16-1 would be applied to all the lease parcels. The inclusion of these requirements at the leasing stage provide notification to the lessee that potentially valuable cultural resource values are or are likely to be present on the lease parcels and the potential mitigation measures that may be required. The application and implementation of these stipulations and lease notices at the development stage would provide the necessary measures to protect cultural resources.

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

4.3.11 Native American Religious Concerns

4.3.11.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on Native American religious concerns. Any potential effects from the sale of leases could occur at the time the leases are developed.

Leasing parcels located near the Fort Peck Reservation in Daniels, McCone, Richland, Roosevelt, and Sheridan Counties would not interfere with the performance of traditional ceremonies and rituals pursuant to the American Indian Religious Freedom Act (AIRFA) or EO 13007. Leasing parcels in this area would not prevent tribes from visiting sacred sites or prevent possession of sacred objects.

4.3.11.2 Mitigation

Mitigation would be the same as section 4.3.10.2 above. For those parcels where no inventory data is available or where no information is available for TCPs, BLM would apply the cultural lease notice (CR 16-1).

4.3.12 Paleontology

4.3.12.1 Direct and Indirect Effects

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

Indirect impacts from the sale of leases would be from the surface disturbances associated with oil and gas exploration and development activities. It is anticipated that most significant fossil resources are located in those geologic units with a Potential Fossil Yield Classification (PFYC) of 3 or higher. However, significant fossil resources could be discovered anywhere. Surface-disturbing activities could potentially alter the characteristics of paleontological resources through damage, fossil destruction, or disturbance of the stratigraphic context in which paleontological resources are located, resulting in the loss of important scientific data. Identified paleontological resources could be avoided by project redesign or relocation before project approval which would negate the need for the implementation of mitigation measures.

Conversely, surface-disturbing activities could potentially lead to the discovery of paleontological localities that would otherwise remain undiscovered due to burial or omission during review inventories. The scientific retrieval and study of these newly discovered resources would expand our understanding of past life and environments of Montana.

4.3.12.2 Mitigation

The application of lease terms, the paleontological no surface occupancy stipulation (NSO 11-12), and the paleontological lease notice (LN 14-12) at leasing, provides protection to paleontological resources during development. The paleontological lease notice is applied to those lease parcels that fall within the PFYC 3 or higher geologic units, requiring a field survey prior to surface disturbance. These inventory requirements could result in the identification of paleontological resources. Avoidance of significant paleontological resources or implementation of mitigation prior to surface disturbance would protect paleontological resources. However, the application of lease terms only allows the relocation of activities up to 200 meters, unless documented in the NEPA document, and cannot result in moving the activity off lease.

Specific mitigation measures could include, but are not limited to, site avoidance or excavation. Avoidance of paleontological properties would be a best management practice. However, should a paleontological locality be unavoidable, significant fossil resources would be mitigated prior to implementation of a project. Also, significant fossil resources could be discovered in areas that had not been surveyed (PFYC of less than 3) during surface disturbance. Those resources would also be mitigated. These mitigation measures and contingencies would be determined when site specific development proposals are received.

In order to protect paleontological resources 38 of the parcels are recommended to have the Paleontological lease notice 14-12 applied per guidance identified in IM 2009-011 and 2008-009. No parcels are recommended for the no surface occupancy lease stipulation (NSO 11-12) based upon paleontological resources.

4.3.13 Visual Resources

4.3.13.1 Direct and Indirect Effects

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

The lease parcels fall into VRM classes II, III and IV, as demonstrated in Section 3.11, Visual Resources, Table 8. While the act of leasing federal minerals produces no visual impacts, development of a lease parcel could result in some level of modification to the existing landscape at the time of development.

4.3.13.2 Mitigation

All new oil and gas development would implement, as appropriate for the site, BLM BMPs for 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 not reduce the visual qualities or scenic value that currently exists.

Specifically, visual impacts would be minimized in the Class II areas by the use of the lease stipulation. The stipulation states “all surface-disturbing activities, semi-permanent and permanent facilities in VRM Class II, areas may require special design, including location, painting, and camouflage, to blend with the natural surroundings and meet the visual quality objectives for the area.” In addition those modifications would follow the existing form, line, color and texture of the current landscape. Measure would be taken to mitigate the visual impacts within a Class III and Class IV area to protect the scenic value.

4.3.14 Forest and Woodland Resources

4.3.14.1 Direct and Indirect Effects

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

Potential impacts from oil and gas development could include the cutting and subsequent removal of forest and woodland vegetation from drill-site development areas; including roads, pads, reserve and earthen pits, surface facilities, pipelines, and powerlines. The degree of impact would vary according to the precise location of development activities in the parcel area and is directly related to topography, miles of road construction (including right-of-way), standing timber volume per acre, and total acres of surface facilities development. Larger numbers of miles/acres of surface disturbance and steeper slopes with larger cuts and fills within forested areas signify that a greater volume of forest and woodland vegetation would be removed. A total of approximately 116.28 forest and woodland acres could potentially be impacted under this alternative; 24.13 acres of evergreen, 44.44 acres of deciduous, and 47.71 acres of mixed evergreen-deciduous forest.

4.3.14.2 Mitigation

Measures would be taken to prevent, minimize, or mitigate impacts to forest and woodland resources from exploration and development activities. Prior to authorization, activities would be evaluated on a case-by-case basis, and the project would be subject to mitigation measures. The road construction and maintenance BMPs outlined in the Gold Book are consistent with the Water Quality BMPs for Montana Forests (Logan 2001) which are designed to protect water quality and forest soils. Other mitigation measures could include the artificial planting of bareroot or containerized nursery stock seedlings.

All severed forest and woodland vegetative material would need to be removed or reduced to acceptable standards meeting Montana's Control of Timber Slash and Debris Law (Title 76, Chapter 13, Part 4), commonly referred to as the "Slash" Law; therefore, requiring burning, grinding, chipping, burying, or hauling residual debris off-site to a designated landfill or other location for disposal.

4.3.15 Livestock Grazing

4.3.15.1 Direct and Indirect Effects

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

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

4.3.15.2 Mitigation

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

4.3.16 Recreation and Travel Management

4.3.16.1 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 could occur at the time the leases are developed.

Lease parcel MTM 102757-PD (192 acres) and lease parcel MTM 102757-YM 38 acres) are located within the Lewis and Clark Trail Special Recreation Management Area. Indirect effects from lease parcel development are disclosed below.

Recreation indirect effects could exist where oil and gas development and recreational user conflicts could occur. More specifically, in areas of high oil and gas development potential, there could be user conflicts between motorized recreationists (OHV activities), hunting, target shooting, camping, fishing, river use, picnicking, and winter activities (e.g., snowmobiling) and associated oil and gas activities. These impacts 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.). Recreationists could lose some benefit outcomes such as loss of importance sense of place, solitude and possible increase of stress.

Areas frequented by recreationists, where there are other land use activities occurring, in addition to oil and gas development, the public could perceive these areas as inaccessible or unavailable because of the existing facilities. As oil and gas development occurs, new routes are 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.

For those areas with isolated tracks of BLM public lands that generally do not have existing public access, recreation opportunities that occur in these areas are limited to use with adjacent land owner permission or hunting by an outfitter; therefore, oil and gas activities would have little or no impact on recreational experiences in these isolated tracks.

Foreseeable changes in recreation use levels would be an increase on the demand for recreational use of public land. 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.

4.3.16.2 Mitigation

Stipulation NSO 11-13 would be attached to lease parcels MTM 102757-PD and YA , which states “surface occupancy and use is prohibited within developed recreation areas and undeveloped recreation areas receiving concentrated public use to protect developed recreation areas and undeveloped recreation areas receiving concentrated public use.”

Additional measures would be taken to minimize, avoid, or mitigate impacts to recreation from oil and gas exploration and development activities. Prior to authorization, activities would be evaluated on a case-by-case basis, and the project would be subject to mitigation measures. Mitigation measures could potentially include, but are not limited to, reclamation of industrial routes/areas when no longer needed, fencing of facilities, and installing signs along roads.

4.3.17 Lands and Realty

4.3.17.1 Direct and Indirect Effects

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

Facilities associated with oil and gas development could cause disturbance to the existing rights-of-way (ROWs) as identified in Appendix F. The ROWs are located on eight lease parcels (MTM-102757 XF, WP, X9, X8, YA, WR, XJ, XB). Additional ROWs could be required across federal surface for “off-lease” or third party facilities required for potential development of the parcels.

4.3.17.2 Mitigation

Measures would be taken to avoid disturbance to or impacts to existing rights-of-way, identified in Appendix F, in the event of any oil and gas exploration and development activities. Any new “off-lease” or third party rights-of-way required across federal surface for exploration and/or development of the 49 parcels would be subject to lands and realty stipulations to protect other resources as determined by environmental analyses. In order to protect the existing rights-of-way it is recommended that LN 14-1 be applied to the following lease parcels: MTM-102757 XF, WP, X9, X8, YA, WR, XJ, and XB.

4.3.18 Minerals

4.3.18.1 Fluid Minerals

4.3.18.1.1 Direct and Indirect Effects

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

Issuing a lease provides opportunities to explore for and develop oil and gas. Additional natural gas or crude oil produced from any or all of the 49 parcels could enter the public markets. There could be a reduction in the known amount of oil and gas resources. Royalties and taxes could accrue to the federal and state treasuries from the lease parcel lands.

Under Alternative B, all of the lease parcels would be offered for lease subject to major (NSO) or moderate (CSU) constraints and/or standard lease terms and conditions.

Stipulations applied to various areas with respect to occupancy, timing limitation, and control of surface use could affect oil and gas exploration and development, both on and off the federal lease parcel. Leases issued with major constraints (NSO stipulations) could decrease some lease values, increase operating costs, and require relocation of well sites, and modification of field development. Leases issued with moderate constraints (timing limitation and controlled surface Use (CSU) stipulations) could result in similar but reduced impacts, and delays in operations and uncertainty, on the part of operators, regarding restrictions.

4.3.19 Special Designations

4.3.19.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on acres with special designations. Any potential effects from the sale of leases could occur at the time the leases are developed.

4.3.19.2 National Historic/Scenic Trails

Lease parcels MTM 102757-PD and YA (approximately 230 acres) in whole or part are located within the Lewis and Clark National Historic Trail. Indirect effects from lease development on the landscape would be managed by Class II visual resource management objectives and the

Lewis and Clark Trail Special Recreation Management Area. For indirect effects see sections 4.3.13 Visual Resources and 4.3.16 Recreation and Travel Management

Potential effects from surface disturbances associated with exploration and development activities after leasing have the potential to alter the characteristics of the significant Lewis and Clark National Historic Trail cultural and historic property by diminishing the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Other effects to the Lewis and Clark National Historic Trail cultural resource from proposed surface disturbance activities include the destruction, damage, or alteration to all or part of the cultural resource and diminishing the property's significant historic features as a result of the introduction of visual, atmospheric, or audible elements. This could alter or diminish the elements of a National Register eligible property and diminish the property's eligibility status. Cultural resource investigations associated with development potentially adds to our understanding of the prehistory/history of the area and discovery of sites that would otherwise remain undiscovered due to burial or omission.

4.3.19.4 Mitigation

The mitigation measures for the Lewis and Clark NHT would be the same as those described in Sections 4.3.10.2 Cultural Resources, 4.3.13.2 Visual Resources and 4.3.16.2, Recreation and Travel Management.

4.3.20 Social and Economic Conditions

4.3.20.1 Social

4.3.20.1.1 Direct and Indirect Effects

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

While the act of leasing Federal minerals itself would result in no social impact, subsequent exploration and development may generate impacts to people living near or using the area in the vicinity of the lease. Exploration, drilling or production could create an inconvenience to people living adjacent to leases due to increased traffic and traffic delays, and light, noise and visual impacts. This could be especially noticeable in rural areas where oil and gas development has not occurred previously. The amount of inconvenience would depend of the activity affected, traffic patterns within the area, noise and light levels, length of time and season these activities occur, etc. In addition, competition for housing could occur in some communities. However, residents living in areas that have been experiencing ongoing population losses may support the increased employment and population related to oil and gas development. Residents of counties where the development actually occurs would also benefit from the additional revenues to counties due to oil and gas leasing and development.

There is potential for disproportionate effects to low income or minority populations, specifically American Indian populations. Consultation with potentially affected Tribes would occur at the APD stage.

4.3.20.2 Economics

4.3.20.2.1 Direct and Indirect Effects

The basis for economic impacts is the number of acres leased, rents paid, and level of production by alternative. 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 and rent of federal minerals, 2) 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. Table 13 is a summary of local revenues, employment, income, population, and household impacts of each alternative.

Leasing approximately 21,323 additional acres of federal minerals (Alternative B) would increase average annual oil and gas leasing and rent revenues to the federal government by an estimated \$81,239. Average annual leasing and rent revenues that could be distributed to state/local governments could increase by an estimated \$38,832; average annual federal oil and gas royalties could increase by an estimated \$242,173; and average annual royalties distributed to the state/counties could increase by an estimated \$115,759 compared to current levels.

Total average annual federal revenues related to leasing approximately 21,323 additional acres of federal minerals and associated annual rent and royalty revenues related to average annual production of federal minerals could amount to an estimated \$323,412. Of this, an estimated \$154,591 could be disbursed to the state. Total estimated revenues distributed to the counties could be about \$41,680.

The estimated combined total average annual employment would likely increase from current levels by an estimated 26 jobs and income supported by the additional federal oil and gas leasing, distributions of royalties to local governments, drilling wells, and production would increase by about \$1.87 million within the 10-county local economy (IMPLAN, 2010). There would also be an increase in local population (34 people) and households (12).

Total federal contribution of Alternative B and anticipated related exploration, development, and production of oil and gas could affect local population, total local employment, number of households, average income per household, and total personal income. The economic effects would be spread unevenly among the counties. Most of the revenue would go to Prairie County and most of the employment, income, population, and housing effects would occur in Williston, Sidney, and Glendive. Leasing 21,288 additional acres and associated exploration, development, and production under Alternative B would provide additional funds (about \$41,680) for county functions such as enforcing laws, administering justice, collecting and disbursing tax funds, providing for orderly elections, maintaining roads and highways, providing fire protection, and keeping records. Other county functions that could be funded include administering primary and secondary education and operating clinics/hospitals, county libraries, county airports, local landfills, and county health systems. Demand for these services would also increase. Leasing 21,288 additional acres and anticipated exploration, development, and production would change local economic diversity (as indicated by the number of economic sectors), economic dependency (where one or a few industries dominate the economy), and economic stability (as indicated by seasonal unemployment, sporadic population changes and fluctuating income rates)

very little across the 10-county area because oil and gas exploration, development, and production is well established in the local economy.

4.3.21 Cumulative Impacts- Alternative B

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 (40 CFR 1508.7). 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.

4.3.21.1 Past, Present and Reasonably Foreseeable Future Actions

Past, present, or reasonably foreseeable future actions that affect the same components of the environment as the Proposed Action are: grazing, roads, wildfire and prescribed fire, range improvement projects, and utility right-of-ways.

4.3.21.2 Cumulative Impacts by Resource

Cumulative effects for all resources in the MCFO are described in the final Big Dry RMP/EIS (pgs. 111 to 156) and the 1992 Oil and Gas Amendment of the Billings, Powder River, and South Dakota Resource Management Plans and Final Environmental Impact Statement and the 1994 Record of Decision and the 2008 Final Supplement to the Montana Statewide Oil and Gas Environmental Impact with a development alternative for coal bed natural gas production (4-1 to 4-310). Anticipated exploration and development activities associated with the lease parcels considered in this EA are within the range of assumptions used and effects described in this cumulative effects analysis for resources other than air, climate, and socio-economics resources. This previous analysis is hereby incorporated by reference for resources other than for air, climate, and economics resources.

4.3.21.2.1 Greenhouse Gas Emissions and Cumulative Impacts on Climate Change

The cumulative effects analysis area is the MCFO, with additional discussion at state-wide, national, and global scales for GHG emissions 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 end uses of final products.

Projected GHG emissions for this project and the MCFO 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 for the sake of providing context for the potential contributions of GHGs associated with this project.

As discussed in the Air Quality section of Chapter 4, total projected BLM GHG emissions from the RFD are 610,741.1 metric tons/year CO₂e. Potential emissions under Alternative B would be approximately 0.4 percent of this total. Table 19 displays projected GHG emissions from non-BLM activities included in the Miles City RFD. Total projected emissions of non-BLM activities in the RFD in Appendix B are 1,382,890 metric tons/year of CO₂e. When combined with projected annual BLM emissions, this totals 1,993,631 metric tons/year CO₂e. Potential GHG emissions under Alternative B would be 0.1 percent of the estimated emissions for the entire RFD. Potential incremental emissions of GHGs from exploration and development of fluid minerals on parcels within Alternative B, and Alternative C, would be minor in the context of projected GHG contributions from the entire RFD for the MCFO.

Table 19. Projected non-BLM GHG Emissions Associated With the MCFO Reasonably Foreseeable Development Scenario for Fluid Mineral Exploration and Development.

Source	Non-BLM Long-Term GHG Emissions in tons/year				Emissions (metric tons/yr)
	CO ₂	CH ₄	N ₂ O	CO ₂ e	CO ₂ e
Conventional Natural Gas	545,689.1	5425.9	2.1	658,344.3	599,170.7
Coal Bed Natural Gas	274,925.2	5,330.5	0.9	387,135.7	351,302.8
Oil	422,033.9	2,576.2	1.2	476,522.7	432,416.3
Total	1,242,648.3	13,332.6	4.2	1,522,002.7	1,382,889.8

Montana's Contribution to U.S. and Global GHGs

Montana's GHG inventory (<http://www.eia.doe.gov/oiaf/1605/archive/gg04rpt/emission.html>, Center for Climate Strategies [CCS] 2007) shows that activities within the state contribute 0.6 percent of U.S and 0.076 percent of global GHG emissions (based on 2004 global GHG emission data from the IPCC, summarized in the Climate Change SIR 2010). Based on 2005 data in the state-wide inventory, the largest source of Montana's emissions is fossil fuel combustion to generate electricity, which accounts for approximately 27 percent of Montana's emissions. The next largest contributors are the agriculture and transportation sectors (each at approximately 22 percent) and fossil fuel production (13.6 percent).

GHG emissions from all major sectors in Montana in 2005 added up to a total of approximately 36.8 million metric tons of CO₂e (CCS 2007). Potential emissions from development of BLM lease parcels included in Alternative B would represent approximately 0.007 percent of the state-wide total of GHG emissions based on the 2005 state-wide inventory (CCS 2007).

The EPA published an inventory of U.S. GHG emissions, indicating gross U.S. emissions of 6,633 million metric tons, and net emissions of 5,618 million metric tons (when CO₂ sinks were considered) of CO₂e in 2009 (EPA 2011). Potential annual emissions under Alternative B of this project would amount to approximately 0.00004 percent of gross U.S. total emissions. Global GHG emissions for 2004 (IPCC 2007, summarized by the Climate Change SIR 2010) indicated

approximately 49 gigatonnes (10⁹ metric tons) of CO₂e emitted. Potential annual emissions under Alternative B would amount to approximately 0.000005 percent of this global total.

As indicated above, although the effects of GHG emissions in the global aggregate are well-documented, it is currently not 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 could incrementally contribute to the total volume of GHGs emitted to the atmosphere, and ultimately to climate change.

Mitigation measures identified in the Chapter 4 Air Quality section above may be in place at the APD stage to reduce GHG emissions from potential oil and gas development on lease parcels under Alternative B. This is likely because many operators working in Montana, South Dakota, and North Dakota are currently USEPA 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).

4.3.21.2.2 Cumulative Impacts of Climate Change

As previously discussed in the Air Quality section of Chapter 4, it is impossible to identify specific impacts of climate change on specific resources within the analysis area. 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 changes at small scales. On smaller scales, natural climate variability is relatively larger, making it harder to distinguish changes expected due to external forcings (such as contributions from local activities to GHGs). Uncertainties in local forcings and feedbacks also make it difficult to estimate the contribution of GHG increases to observed small-scale temperature changes (IPCC 2007, as cited by the Climate Change SIR 2010). Effects of climate change on resources are described in Chapter 3 of this EA and in the Climate Change SIR (2010).

4.3.21.3 Cumulative Impacts to Wildlife

For wildlife species, past and presently on-going oil and gas development, fire, farming, livestock grazing, traffic, and any other form of human and natural disturbances result in cumulative impacts to wildlife.

Construction of roads, production well pads, and other facilities would result in long term (>5 years) loss of habitat and forage in the analysis area. This would be in addition to acres disturbed, or habitats fragmented from various other adjacent activities. As new development occurs, direct and indirect impacts could 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 could be affected by increased habitat fragmentation and interruptions to preferred 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 could 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 could be influenced to different degrees by various human activities. Some species and/or a few individuals from a species group could be able to adapt to these human influences over time.

4.3.21.4 Cumulative Impacts to Economic Conditions

The cumulative effects of federal mineral leasing within the local economy as well as the specific effects of leasing an additional 21,323.0373 acres under Alternative B are summarized in Table 15 and 16. These tables also display in comparative form the cumulative effects of alternatives A, B, and C.

4.4 Alternative C (BLM Preferred)

4.4.1 Direct Effects Common to All Resources

Under Alternative C, 42 of the 49 lease parcels in whole, 18,443.0373 surveyed federal mineral acres (9,346.03 surveyed BLM administered surface, 189.1073 surveyed BOR surface, and 8,907.90 surveyed private/state surface) in whole or part would be offered for competitive oil and gas lease sale. The remaining 7 whole parcels 2,880.00 surveyed federal mineral acres (1,440.00 surveyed BLM administered surface acres and 1,440.00 surveyed acres of private surface) in whole or part would be deferred pending further review.

4.4.2 Indirect Effects Common to All Resources

Oil and gas exploration and development activities such as construction, drilling, production, infrastructure installation, vehicle traffic and reclamation are indirect effects from leasing the lease parcels in Alternative C. It is unknown when, where, how, or if future surface disturbing activities associated with oil and gas exploration and development such as well sites, roads, facilities, and associated infrastructure would be proposed. It is also not known how many wells, if any, would be drilled and/or completed, the types of technologies and equipment would be used and the types of infrastructure needed for production of oil and gas. Thus, the types, magnitude and duration of potential impacts cannot be precisely quantified at this time, and would vary according to many factors. The potential impacts from Alternative C would be analyzed after receipt of an APD or sundry notice.

Typical impacts to resources from oil and gas exploration and development activities such as well sites, roads, facilities, and associated infrastructure are described in the Miles City Oil & Gas Amendment/EIS (1994), the Big Dry RMP (1996), the Montana Statewide Oil & Gas Amendment/EIS (2003) and the Supplement (2008) to that document.

4.4.3 Air Resources

4.4.3.1 Air Quality

4.4.3.1.1 Direct and Indirect Effects

Air quality impacts would likely be slightly less than those for Alternative B. Fewer leased acres would likely result in less future development and fewer emissions than Alternative B.

4.4.3.1.2 Mitigation

Mitigation would be the same as Alternative B.

4.4.3.2 GHG Emissions

4.4.3.2.1 Direct and Indirect Effects

Alternative C GHG emissions would likely be slightly less than those for Alternative B.

4.4.3.2.2 Mitigation

Mitigation would be the same as Alternative B.

4.4.3.3 Climate Change

4.4.3.3.1 Direct and Indirect Effects

Under Alternative C, climate change impacts would likely be slightly less than those for Alternative B.

4.4.3.3.2 Mitigation

Mitigation would be the same as Alternative B.

4.4.4 Soil Resources

4.4.4.1 Direct and Indirect Effects

Direct and indirect impacts would be the same as Alternative B; however, the area potentially impacted would be reduced by 13.5 percent due to approximately 2,880 acres of parcels proposed for deferral pending further review. The potentially impacted acres within the Lower Yellowstone River – Sunday Creek watershed would not be impacted under this alternative.

4.4.4.2 Mitigation

Mitigation would be the same as Alternative B.

4.4.5 Water Resources

4.4.5.1 Direct and Indirect Effects

Direct and indirect impacts would be the same as Alternative B; however, the area potentially impacted would be reduced by 13.5 percent, due to approximately 2,880 acres of the lease parcels proposed for deferral pending further review.

The potentially impacted acres on water resources would be decreased by 480 acres, all within the Lower Yellowstone River – Sunday Creek watershed in Rosebud County.

4.4.5.2 Mitigation

Mitigation would be the same as Alternative B.

4.4.6 Vegetation Resources

4.4.6.1 Direct and Indirect Effects

Direct and indirect impacts would be the same as Alternative B; however, the area potentially impacted would be reduced by 13.5 percent due to approximately 2,880 acres of the lease parcels proposed for deferral pending further review.

4.4.6.2 Mitigation

Mitigation would be the same as Alternative B.

4.4.7 Riparian-Wetland Habitats

4.4.7.1 Direct and Indirect Effects

Direct and indirect impacts would be the same as Alternative B; however, the area potentially impacted would be reduced by 13.5 percent, due to approximately 2,880 acres of the lease parcels proposed for deferral pending further review.

The potentially impacted acres on riparian resources would be decreased by 120 acres.

4.4.7.2 Mitigation

Mitigation would be the same as Alternative B.

4.4.8 Special Status Plant Species

4.4.8.1 Direct and Indirect Effects

Direct and indirect impacts would be same as Alternative B; however the area potentially impacted would be reduced by 13.5 percent, due to approximately 2,880 acres of lease parcels proposed for deferral pending further review.

4.4.8.2 Mitigation

Mitigation would be that same as Alternative B.

4.4.9 Wildlife & Fisheries/Aquatics

4.4.9.1 Direct and Indirect Effects

Direct and indirect impacts would be similar to Alternative B; however, the area impacted would be reduced by 13.5 percent, due to these lease parcels proposed for deferral pending further review. If deferred, this alternative would reduce the amount of parcels proposed in mule deer winter range, pronghorn winter range, Sprague's pipit habitat, prairie dog colonies and associated species habitat, and within 2 miles of both sage grouse and sharp-tailed grouse leks. Potential impacts to these resources would be reduced under this alternative. The parcels proposed for deferral overlap with the range of four BLM sensitive aquatic species, the Snapping Turtle, Spiny Softshell, Plains Spadefoot and Great Plains Toad. If deferred, this alternative would reduce the impacts to these BLM sensitive aquatic species' habitat.

As stated in chapter 3, sage grouse habitat delineations have been developed for the sage grouse conservation alternatives being considered in the future MCFO RMP planning effort. In accordance with IM 2012-043, the 7 parcels within the PPH delineated areas will not be analyzed or offered for lease under this alternative pending review in the current MCFO RMP planning effort. Therefore, no direct, indirect, or potential additional cumulative effects to sage grouse within these areas will occur as a result of this alternative.

4.4.9.2 Mitigation

Mitigation would be the same as Alternative B.

4.4.10 Cultural

4.4.10.1 Direct and Indirect Effects

Direct and indirect impacts would be similar to those disclosed in Alternative B; however the area potentially impacted would be reduced by 13.5 percent, due to approximately 2,880 acres of lease parcels proposed for deferral pending further review.

Specifically, potential effects would not occur on the 7 lease parcels proposed for deferral all within Rosebud County. There will be no changes to the analysis of leasing the proposed parcels in the remaining counties analyzed in Alternative B.

Leasing the 18,443 acres of federal minerals within the above described counties could indirectly affect 96 cultural sites with 10 to 15 sites having the potential to be eligible or considered eligible for listing on the National Register of Historic Places.

4.4.10.2 Mitigation

Mitigation would be the same as Alternative B.

4.4.11 Native American Religious Concerns

4.4.11.1 Direct and Indirect Effects

Direct and indirect impacts would be similar to those disclosed in Alternative B; however the area potentially impacted would be reduced by 13.5 percent, due to approximately 2,880 acres of lease parcels proposed for deferral pending further review.

4.4.11.2 Mitigation

Mitigation would be the same as Alternative B.

4.4.12 Paleontology

4.4.12.1 Direct and Indirect Effects

Direct and indirect impacts would be similar to those disclosed in Alternative B; however the area potentially impacted would be reduced by 13.5 percent, due to approximately 2,880 acres of lease parcels proposed for deferral pending further review. Lease parcels in PFYC 3-5 would be reduced to 31 lease parcels.

4.4.12.2 Mitigation

Mitigation would be the same as Alternative B.

4.4.13 Visual Resources

4.4.13.1 Direct and Indirect Effects

Direct and indirect impacts would be the same as Alternative B; however, the area potentially impacted would be reduced by 13.5 percent, due to approximately 2,880 acres of lease parcels proposed for deferral pending further review. The deferred lease parcels are all located in Rosebud County. Table 20 shows the acres of BLM surface that are recommended for deferral and their respective VRM Classification.

Table 20. BLM surface acres deferred by VRM classification

Leasing Areas	VRM Class II Acres	VRM Class III Acres	VRM Class IV Acres
<i>ROSEBUD COUNTY</i>	<i>0 total acres</i>	<i>313 total acres</i>	<i>1,128 total acres</i>
MTM 102757-43			640
MTM 102757-46		313	9
MTM 102757-47			160
MTM 102757-49			319

4.4.13.2 Mitigation

Mitigation would be the same as Alternative B.

4.4.14 Forest and Woodland Resources

4.4.14.1 Direct and Indirect Effects

Direct and indirect impacts would be the same as Alternative B; however, the area potentially impacted would be reduced by 13.5 percent, due to approximately 2,880 acres of lease parcels proposed for deferral pending further review. Under this alternative, acreage potentially impacted would be approximately 24.13 acres of evergreen, 41.16 acres of deciduous, and 47.75 acres of mixed evergreen-deciduous forest.

4.4.14.2 Mitigation

Mitigation would be the same as Alternative B.

4.4.15 Livestock Grazing

4.4.15.1 Direct and Indirect Effects

Direct and indirect impacts would be the same as Alternative B; however, the area potentially impacted would be reduced by 13.5 percent, due to approximately 2,880 acres of lease parcels proposed for deferral pending further review.

4.4.15.2 Mitigation

Mitigation would be the same as Alternative B.

4.4.16 Recreation and Travel Management

4.4.16.1 Direct and Indirect Effects

Direct and indirect impacts would be the same as Alternative B; however, the area potentially impacted would be reduced by 13.5 percent, due to approximately 2,880 acres of lease parcels proposed (1,440 federal surface acres) for deferral pending further review.

4.4.16.2 Mitigation

Mitigation would be the same as Alternative B.

4.4.17 Lands and Realty

4.4.17.1 Direct and Indirect Effects

Under this alternative 42 parcels, consisting of 18,443.0373 surveyed surface acres (9,346.03 surveyed BLM administered surface acres, 8,836.06 surveyed private surface acres, 189.1073 surveyed BOR surface acres, and 71.84 surveyed state surface acres) would be offered for lease.

Direct and indirect impacts would be the same as Alternative B; however, the area potentially impacted would be reduced by approximately 13.5 percent, due to approximately 2,880 surveyed surface acres of 7 lease parcels being proposed for deferral, pending further review. The parcels or portions of parcels proposed for deferral consist of 1,440.00 surveyed BLM administered surface acres and 1,440.00 surveyed private surface acres, all in Rosebud County.

Based on the Master Title plats and LR2000 reports, none of the proposed deferred parcels have BLM authorized ROWs on them. The eight lease parcels listed in Appendix E containing

authorized BLM ROWs on BLM administered surface would potentially be affected under this alternative.

4.4.17.2 Mitigation

Mitigation would be the same as Alternative B.

4.4.18 Minerals

4.4.18.1 Fluid Minerals

4.4.18.1.1 Direct and Indirect Effects

Direct and indirect impacts would be the same as Alternative B; however, the area potentially impacted would be reduced by 13.5 percent, due to approximately 2,880 acres of lease parcels proposed for deferral pending further review. The remaining 42 lease parcels would be offered for lease subject to major (NSO) or moderate (CSU) constraints and/or standard lease terms and conditions.

Deferring lease parcels would result in delays of some development plans, relocation of development to state or private leases, or completely eliminate development plans because of the need to include federal acreage as part of a plan. In addition, less natural gas or crude oil would enter the public markets.

4.4.19 Special Designations

4.4.19.1 Direct and Indirect Effects

Direct and indirect impacts would be the same as Alternative B.

4.4.19.2 Mitigation

Mitigation would be the same as Alternative B for the Lewis and Clark NHT.

4.4.20 Social and Economic Conditions

4.4.20.1 Social

4.4.20.1.1 Direct and Indirect Effects

Direct and indirect impacts would be the same as Alternative B; however, the area potentially impacted would be reduced by less than 13.5 percent, due to the deferral of 2,880 acres of lease parcels in Rosebud County.

4.4.20.2 Economics

4.4.20.2.1 Direct and Indirect Impacts

Economic impacts associated with Alternative C would be very similar to those described for Alternative B. Under this alternative, leasing an additional 18,443 acres of federal minerals could increase average annual oil and gas leasing and rent revenues to the federal government by an estimated \$70,249. Average annual leasing and rent revenues that could be distributed to state/local governments could increase by an estimated \$33,579. Average annual federal oil and gas royalties would increase by an estimated \$209,410. Average annual royalties distributed to the state/counties could increase by an estimated \$100,098.

Total average annual federal revenues and associated annual rent and royalty revenues related to average annual production of federal minerals could amount to an estimated \$279,660. Total

average annual revenues from leasing, rent, and royalties distributed to the state and counties could be an estimated \$133,677. Total estimated revenues distributed to the counties could be about \$36,041.

The estimated combined total average annual employment and income supported by additional federal oil and gas leasing, distributions of royalties to local governments, drilling wells, and production could amount to an estimated 22 total jobs (full and part-time) and \$1.56 million within the local economy (IMPLAN, 2010). There would be an estimated increase in local population (29 people) and households (12).

Total federal contribution under Alternative C and anticipated related exploration, development, and production of oil and gas could cause local population, total local employment, number of households, average income per household, and total personal income would be very similar to impacts expected from Alternative B. The economic effects would continue to be spread unevenly among the counties. Most of the local revenue would go to Prairie County and most of the employment, income, population, and housing effects would occur in Williston, Sidney, and Glendive. Leasing the additional 18,443 acres and anticipated exploration, development, and production under alternative C would provide additional funds for county functions such as enforcing laws, administering justice, collecting and disbursing tax funds, providing for orderly elections, maintaining roads and highways, providing fire protection, or keeping records. Demand for these services would also increase along with the population. Leasing additional acres and anticipated exploration, development, and production would likely 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) across the 10-county area very little because oil and gas exploration, development, and production is well established in the local economy.

4.4.21 Cumulative Impacts- Alternative C

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 (40 CFR 1508.7). 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.

4.4.21.1 Past, Present and Reasonably Foreseeable Future Actions

Past, present, or reasonably foreseeable future actions that affect the same components of the environment as the Proposed Action are: grazing, roads, wildfire and prescribed fire, range improvement projects, and utility right-of-ways.

4.4.21.2 Cumulative Impacts by Resource

Cumulative effects for all resources in the MCFO are described in the final Big Dry RMP/EIS (pgs. 111 to 156) and the 1992 Oil and Gas Amendment of the Billings, Powder River, and South Dakota Resource Management Plans and Final Environmental Impact Statement and the 1994 Record of Decision and the 2008 Final Supplement to the Montana Statewide Oil and Gas Environmental Impact with a development alternative for coal bed natural gas production (4-1 to 4-310). Anticipated exploration and development activity associated with the lease parcels considered in this EA are within the range of assumptions used and effects described in this cumulative effects analysis for resources other than climate, wildlife, and economics resources.

4.4.21.3 Greenhouse Gas Emissions and Cumulative Impacts on Climate Change

GHG Emissions and cumulative impacts on climate change would likely be slightly less than those under Alternative B.

4.4.21.4 Cumulative Impacts of Climate Change

Due to the relatively small decrease in GHG emissions under Alternative C, cumulative climate change impacts on resources would be slightly less than those for Alternative B.

4.4.21.5 Cumulative Impacts to Wildlife & Fisheries/Aquatics

Cumulative impacts would be the same as Alternative B; however, the area potentially impacted would be reduced by 7 whole parcels pending further review. If the remaining lease parcels are developed, potential additional cumulative impacts to wildlife would occur over less area than what is described in Alternative B.

4.4.21.6 Cumulative Impacts to Economic Conditions:

Direct and indirect impacts would be similar to Alternative B. Under this alternative, the cumulative effects of federal mineral leasing within the local economy as well as the specific effects of leasing approximately 18,443 acres are summarized in Table 15 and 16. These tables also display in comparative form the cumulative effects of alternatives A, B, and C.

5.0 CONSULTATION AND COORDINATION:

5.1 Persons, Agencies, and Organizations Consulted

Coordination with MFWP was conducted for the 49 lease parcels being reviewed and in the completion of this EA in order to prepare the analysis, identify protective measures, and apply stipulations and lease notices associated with these parcels being analyzed. Recommendations by the USFWS applied in previous lease sale EAs were also applied to the 49 lease parcels being reviewed. A letter was sent to the USFWS and MFWP during the 15-day scoping and 30-day public comment periods requesting comments on the 49 parcels being reviewed.

The BLM consults with Native Americans under Section 106 of the National Historic Preservation Act. BLM sent letters to tribes in Montana, North and South Dakota and Wyoming at the beginning of the 15 day scoping period informing them of the potential for the 49 parcels to be leased and inviting them to submit issues and concerns BLM should consider in the environmental analysis. Letters were sent to the Tribal Presidents and THPO or other cultural contacts for the Cheyenne River Sioux Tribe, Crow Tribe of Montana, Crow Creek Sioux Tribe, Eastern Shoshone Tribe, Ft. Peck Tribes, Lower Brule Sioux Tribe, the Mandan, Hidasta, and Arkira Nation, Northern Arapaho Nation, Northern Cheyenne Tribe, Oglala Sioux Tribe, Rosebud Sioux Tribe of Indians, Standing Rock Sioux Tribe, and Turtle Mountain Band of Chippewa. In addition to scoping letters, THPOs also received file search results from the preliminary review of parcels conducted by BLM. BLM sent a second letter with a copy of the EA to the tribes informing them about the 30 day public comment period for the EA and solicit any information BLM should consider before making a decision whether to offer any or all of the 49 parcels for sale.

5.2 Summary of Public Participation

5.2.1 Scoping

Public scoping for this project was conducted through a 15-day scoping period advertised on the BLM Montana State Office website and posting on the field office website NEPA notification log. Scoping was initiated October 9, 2012. 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 or oral comments regarding any issues or concerns that should be addressed in the environmental analysis.

In addition, the BLM and nine Tribes (Northern Cheyenne, Cheyenne River Sioux, Rosebud Sioux, Oglala Sioux, Sisseton Wahpeton Oyate, Yankton Sioux, Mandan, Hidatsa, Arikara, and Santee Sioux of Nebraska) met during a two-day BLM Intertribal Workshop in Spearfish, South Dakota on October 17-18, 2012. Agenda items included discussion on the leasing process and the May 2013 sale being reviewed. No specific comments were submitted for the May 2013 lease sale during the workshop.

A total of 12 surface owner notification letters were distributed for the oil and gas leasing analysis process in the MCFO. The written and verbal communication resulted in a total of four individuals submitting comments during the 15-day scoping period.

One comment thanked BLM for opportunity to comment and thought the review would assist BLM in making well considered decisions regarding potential effects to historic properties. Two comments were requests for additional information regarding potential split estate development. One comment addressed concerns related to the location of an existing irrigation ditch and potential mitigation measures during development. Nine comments provided specific information pertaining to recommended mitigation measures for black-tailed prairie dogs, sharp-tailed grouse, sage grouse, raptors, ferruginous hawks, antelope crucial winter range, great blue heron rookeries, and migratory birds in the analysis area.

Table 21. List of Preparers

Name	Title	Responsible for the Following Section(s) of this Document
Susan Bassett	Air Specialist	Air Resources
Bobby Baker	Wildlife Biologist	Wildlife
Christina Stuart	Fisheries Biologist Technician	Fisheries/Water Resources/Riparian Vegetation
Chris Robinson	Hydrologist	Water Resources/Riparian Vegetation
CJ Truesdale	Archaeologist	Cultural/Special Designations
Josh Halpin	Range Management Specialist	Soils
Dena Lang	Outdoor Recreation Planner	Recreation/VRM/Travel Management
Jen Nagy	Natural Resource Specialist	GIS
Tami Sabol	Forester	Forestry
Jeff Gustad	Rangeland Management Specialist	Livestock Grazing/Vegetation/Invasive Species
Doug Melton	Archeologist	Native American Religious Concerns
Greg Liggitt	Paleontologist	Paleontology
Pam Wall	Realty Specialist	Lands/Realty
Paul Helland	Petroleum Engineer	Fluid Minerals/RFD
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Kathy Bockness	Planning & Environmental Coordinator	NEPA
John Thompson	Planning & Environmental Specialist	Economic Analysis/Social Analysis
Merry Prestridge	Legal Land Examiner-Sale Lead	Expressions of Interest/Lease Sale

In addition to the primary preparers listed above, the following individuals provided document review:

Todd Yeager	Field Manager
David Breisch	Asst. Field Manager, Div. of Minerals & Non Renewable
Shane Findlay	Supervisory Land Use Specialist, Div. of Nonrenewable
Diane Friez	District Manager
Jake Chaffin	Fish & Wildlife Program Lead

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7.0 DEFINITIONS

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. NAICS was developed under the auspices of the Office of Management and Budget (OMB), and adopted in 1997 to replace the Standard Industrial Classification (SIC) system and to allow for a high level of comparability in business statistics among the North American countries.

IMPLAN: The IMPLAN Model is the most flexible, detailed and widely used input-output impact model system in the U.S. It provides users with the ability to define industries, economic relationships and projects to be analyzed. It can be customized for any county, region or state, and used to assess "multiplier effects" caused by increasing or decreasing spending in various parts of the economy. This can be used to assess the economic impacts of resource management decisions, facilities, industries, or changes in their level of activity in a given area. The current IMPLAN input-output database and model is maintained and sold by MIG, Inc. (Minnesota IMPLAN Group). The 2007 data set was used in this analysis is.

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFERRAL - NO LEASING
MTM 102757-43	T. 9 N, R. 40 E, PMM, MT SEC. 8 ALL; ROSEBUD COUNTY 640.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 8 SENW,NESW,SWSE; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 SEC. 8 N2,SW,N2SE;	DEFER ALL LANDS Pending further review of priority sage-grouse habitat in current MCFO RMP planning effort.	DEFER ALL LANDS Pending further review of priority sage-grouse habitat in current MCFO RMP planning effort.
MTM 102757-44	T. 9 N, R. 40 E, PMM, MT SEC. 10 W2; ROSEBUD COUNTY 320.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 10 SWNW,W2SW; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) NSO 11-2 SEC. 10 N2NW,SEW; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS)	DEFER ALL LANDS Pending further review of priority sage-grouse habitat in current MCFO RMP planning effort.	DEFER ALL LANDS Pending further review of priority sage-grouse habitat in current MCFO RMP planning effort.
MTM 102757-46	T. 9 N, R. 40 E, PMM, MT SEC. 12 E2; ROSEBUD COUNTY 320.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 12 E2E2,SWNE; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-3 (ALL LANDS)	DEFER ALL LANDS Pending further review of priority sage-grouse habitat in current MCFO RMP planning effort.	DEFER ALL LANDS Pending further review of priority sage-grouse habitat in current MCFO RMP planning effort.

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFERRAL - NO LEASING
MTM 102757-47	T. 9 N, R. 40 E, PMM, MT SEC. 20 W2SW,E2SE; ROSEBUD COUNTY 160.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-3 SEC. 20 W2SW; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS)	DEFER ALL LANDS Pending further review of priority sage-grouse habitat in current MCFO RMP planning effort.	DEFER ALL LANDS Pending further review of priority sage-grouse habitat in current MCFO RMP planning effort.
MTM 102757-48	T. 9 N, R. 40 E, PMM, MT SEC. 24 N2; ROSEBUD COUNTY 320.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 20 SENE; CSU 12-3 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 24 NENE; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS)	DEFER ALL LANDS Pending further review of priority sage-grouse habitat in current MCFO RMP planning effort.	DEFER ALL LANDS Pending further review of priority sage-grouse habitat in current MCFO RMP planning effort.
MTM 102757-49	T. 9 N, R. 40 E, PMM, MT SEC. 34 NWNE,NENW,W2W2,S2SE; ROSEBUD COUNTY 320.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 34 SWNW,SWSW,SWSE; CSU 12-3 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) NSO 11-2 SEC. 34 N2NW; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS)	DEFER ALL LANDS Pending further review of priority sage-grouse habitat in current MCFO RMP planning effort.	DEFER ALL LANDS Pending further review of priority sage-grouse habitat in current MCFO RMP planning effort.

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-4Y	T. 10 N, R. 40 E, PMM, MT SEC. 22 E2; SEC. 26 W2W2; SEC. 34 E2; ROSEBUD COUNTY 800.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 26 W2NW,NWSW; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) NSO 11-2 SEC. 22 NENE; SEC. 26 W2W2; SEC. 34 SESE; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 SEC. 22 E2NE,E2SE; SEC. 26 NWNW, NWSW; SEC. 34 SENE,SE;	DEFER ALL LANDS Pending further review of priority sage-grouse habitat in current MCFO RMP planning effort.	DEFER ALL LANDS Pending further review of priority sage-grouse habitat in current MCFO RMP planning effort.
MTM 102757-WN	T. 13 N, R. 44 E, PMM, MT SEC. 10 N2NE,SENE; SEC. 14 N2NE,NW,S2SE; GARFIELD COUNTY 440.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-1 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) TES 16-2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-1 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) TES 16-2 (ALL LANDS)	
MTM 102757-WU	T. 14 N, R. 44 E, PMM, MT SEC. 22 NWNW; GARFIELD COUNTY 40.00 AC PD	CR 16-1 (ALL LANDS) LN 14-12 (ALL LANDS) TES 16-2 (ALL LANDS)	CR 16-1 (ALL LANDS) LN 14-12 (ALL LANDS) TES 16-2 (ALL LANDS)	

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-WV	T. 14 N, R. 44 E, PMM, MT SEC. 34 NENE,W2NW,SW,SWSE; GARFIELD COUNTY 320.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 34 E2SW,NWSW,SWSE; LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 34 NENE; TES 16-2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 34 E2SW,NWSW,SWSE; LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 34 NENE; TES 16-2 (ALL LANDS)	
MTM 102757-XF	T. 13 N, R. 45 E, PMM, MT SEC. 2 S2; SEC. 10 S2NE,NW,N2SE; SEC. 12 S2N2,N2S2; PRAIRIE COUNTY 960.00 AC ACQ	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 2 W2SW,E2SE; LN 14-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 2 NESW,SE; SEC. 10 W2NW,N2SE; SEC. 12 S2NW,NESW,N2SE; NSO 11-8 SEC. 2 W2SW; SEC. 10 S2NE,NW,N2SE; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS) TL 13-4 SEC. 2 E2SW,SE; SEC. 12 S2NE;	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 2 W2SW,E2SE; LN 14-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 2 NESW,SE; SEC. 10 W2NW,N2SE; SEC. 12 S2NW,NESW,N2SE; NSO 11-8 SEC. 2 W2SW; SEC. 10 S2NE,NW,N2SE; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS) TL 13-4 SEC. 2 E2SW,SE; SEC. 12 S2NE;	

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-XG	T. 13 N, R. 45 E, PMM, MT SEC. 4 SENE,SWSW; PRAIRIE COUNTY 80.00 AC PD	CR 16-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 4 SWSW; NSO 11-8 SEC. 4 SENE; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS)	CR 16-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 4 SWSW; NSO 11-8 SEC. 4 SENE; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS)	
MTM 102757-WP	T. 13 N, R. 45 E, PMM, MT SEC. 4 SWNE,S2NW,N2SW,SESW,SE; SEC. 5 LOTS 1-4; SEC. 5 S2N2,S2; PRAIRIE COUNTY 1036.48 AC ACQ	CR 16-1 (ALL LANDS) LN 14-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 4 SWNE,SESW,S2SE; SEC. 5 LOTS 1-4; SEC. 5 S2NW,N2SW,SE; NSO 11-4 SEC. 5 S2NE,SENW,E2SW,W2SE,NESE; NSO 11-8 SEC. 4 S2NW,SWNE; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS) TL 13-4 SEC. 4 SWNE,S2NW,N2SW; SEC. 5 LOTS 1-4; SEC. 5 S2N2,N2S2;	CR 16-1 (ALL LANDS) LN 14-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 4 SWNE,SESW,S2SE; SEC. 5 LOTS 1-4; SEC. 5 S2NW,N2SW,SE; NSO 11-4 SEC. 5 S2NE,SENW,E2SW,W2SE,NESE; NSO 11-8 SEC. 4 S2NW,SWNE; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS) TL 13-4 SEC. 4 SWNE,S2NW,N2SW; SEC. 5 LOTS 1-4; SEC. 5 S2N2,N2S2;	

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-WQ	T. 13 N, R. 45 E, PMM, MT SEC. 6 LOTS 6,7; SEC. 6 SESW; PRAIRIE COUNTY 121.42 AC PD	CR 16-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS)	CR 16-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS)	
MTM 102757-X9	T. 13 N, R. 45 E, PMM, MT SEC. 7 LOTS 1,2; SEC. 7 NE,E2NW; SEC. 8 N2; SEC. 9 ALL; PRAIRIE COUNTY 1281.21 AC ACQ	CR 16-1 (ALL LANDS) LN 14-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 7 LOTS 1,2; SEC. 7 NE,NENW; SEC. 9 E2NE,S2SW; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS)	CR 16-1 (ALL LANDS) LN 14-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 7 LOTS 1,2; SEC. 7 NE,NENW; SEC. 9 E2NE,S2SW; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS)	
MTM 102757-X8	T. 13 N, R. 45 E, PMM, MT SEC. 12 S2S2; PRAIRIE COUNTY 160.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 12 SESE; LN 14-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-15 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 12 SESE; LN 14-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-15 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS)	

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-YA	T. 13 N, R. 45 E, PMM, MT SEC. 15 ALL; SEC. 22 N2,SW,N2SE; PRAIRIE COUNTY 1200.00 AC ACQ	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 15 W2NW; LN 14-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 15 N2NE,SWNE,NWSE; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 SEC. 15 N2,SW,NWSE; SEC. 22 W2SW;	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 15 W2NW; LN 14-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 15 N2NE,SWNE,NWSE; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 SEC. 15 N2,SW,NWSE; SEC. 22 W2SW;	
MTM 102757-WR	T. 13 N, R. 45 E, PMM, MT SEC. 23 ALL; SEC. 24 NE,N2NW,SENW,NESE; PRAIRIE COUNTY 960.00 AC ACQ	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 23 SENE; LN 14-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 23 SESE; SEC. 24 NWNE,S2NE,E2NW,NESE; NSO 11-8 SEC. 23 NE,E2NW,NESW,SE; SEC. 24 N2NW,SENW; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 SEC. 23 S2S2;	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 23 SENE; LN 14-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 23 SESE; SEC. 24 NWNE,S2NE,E2NW,NESE; NSO 11-8 SEC. 23 NE,E2NW,NESW,SE; SEC. 24 N2NW,SENW; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 SEC. 23 S2S2;	

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-XJ	T. 13 N, R. 45 E, PMM, MT SEC. 24 SWNW,SW,W2SE,SESE; PRAIRIE COUNTY 320.00 AC 95% U.S. MINERAL INTEREST ACQ	CR 16-1 (ALL LANDS) LN 14-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 24 N2SW,SWSW,NWSE, S2SE; NSO 11-8 SEC. 24 SWNW,SW,SWSE; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 SEC. 24 S2SW,SWSE;	CR 16-1 (ALL LANDS) LN 14-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 24 N2SW,SWSW,NWSE, S2SE; NSO 11-8 SEC. 24 SWNW,SW,SWSE; TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 SEC. 24 S2SW,SWSE;	
MTM 102757-WX	T. 14 N, R. 45 E, PMM, MT SEC. 6 LOTS 1-5; SEC. 6 S2NE,SENW; SEC. 8 N2; PRAIRIE COUNTY 635.59 AC ACQ	CR 16-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 6 LOT 5; SEC. 6 S2NE; SEC. 8 SENE; TES 16-2 (ALL LANDS) TL 13-1 SEC. 8 N2; TL 13-3 (ALL LANDS) TL 13-4 SEC. 8 NE;	CR 16-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 6 LOT 5; SEC. 6 S2NE; SEC. 8 SENE; TES 16-2 (ALL LANDS) TL 13-1 SEC. 8 N2; TL 13-3 (ALL LANDS) TL 13-4 SEC. 8 NE;	

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-WY	T. 14 N, R. 45 E, PMM, MT SEC. 10 S2; SEC. 15 ALL; PRAIRIE COUNTY 960.00 AC ACQ	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 10 SWSW,SWSE; SEC. 15 E2NE,N2SW,NESE; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 10 NESW,N2SE; SEC. 15 W2SW; NSO 11-4 SEC. 10 N2SW; TES 16-2 (ALL LANDS) TL 13-1 SEC. 10 NWSW; TL 13-3 (ALL LANDS) TL 13-4 SEC. 10 NESW,SE; SEC. 15 NENE;	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 10 SWSW,SWSE; SEC. 15 E2NE,N2SW,NESE; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 10 NESW,N2SE; SEC. 15 W2SW; NSO 11-4 SEC. 10 N2SW; TES 16-2 (ALL LANDS) TL 13-1 SEC. 10 NWSW; TL 13-3 (ALL LANDS) TL 13-4 SEC. 10 NESW,SE; SEC. 15 NENE;	

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-W3	T. 14 N, R. 45 E, PMM, MT SEC. 12 E2; SEC. 14 E2; PRAIRIE COUNTY 640.00 AC ACQ	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 12 E2; SEC. 14 NE,N2SE; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 12 NENE,S2NE,SE; SEC. 14 E2NE; TES 16-2 (ALL LANDS) TL 13-3 SEC. 12 S2NE,SE; SEC. 14 E2; TL 13-4 SEC. 12 E2;	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 12 E2; SEC. 14 NE,N2SE; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 12 NENE,S2NE,SE; SEC. 14 E2NE; TES 16-2 (ALL LANDS) TL 13-3 SEC. 12 S2NE,SE; SEC. 14 E2; TL 13-4 SEC. 12 E2;	
MTM 102757-W4	T. 14 N, R. 45 E, PMM, MT SEC. 19 LOTS 1-4; SEC. 19 E2,E2W2; SEC. 30 S2NE,E2SW,SE; PRAIRIE COUNTY 956.40 AC ACQ	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 19 N2NE,SENE,NESE; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 19 LOT 3; SEC. 30 SE; NSO 11-8 SEC. 19 LOTS 2-4; TES 16-2 (ALL LANDS) TL 13-3 SEC. 19 LOTS 3,4; SEC. 19 S2NE,E2SW,SE; SEC. 30 S2NE,E2SW,SE;	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 19 N2NE,SENE,NESE; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 19 LOT 3; SEC. 30 SE; NSO 11-8 SEC. 19 LOTS 2-4; TES 16-2 (ALL LANDS) TL 13-3 SEC. 19 LOTS 3,4; SEC. 19 S2NE,E2SW,SE; SEC. 30 S2NE,E2SW,SE;	

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-YB	T. 14 N, R. 45 E, PMM, MT SEC. 20 ALL; SEC. 28 E2NE,W2NW,SEW,NESE,S2SE; PRAIRIE COUNTY 960.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 20 E2NE,SWNE,SEW,NWSE; SEC. 28 E2NE,W2NW,E2SE,SWSE; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-3 SEC. 20 E2NE,SWNE,S2NW,S2; SEC. 28 E2NE,W2NW,SEW, NESE,S2SE;	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 20 E2NE,SWNE,SEW,NWSE; SEC. 28 E2NE,W2NW,E2SE,SWSE; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-3 SEC. 20 E2NE,SWNE,S2NW,S2; SEC. 28 E2NE,W2NW,SEW, NESE,S2SE;	
MTM 102757-W6	T. 14 N, R. 45 E, PMM, MT SEC. 21 ALL; SEC. 29 ALL; PRAIRIE COUNTY 1280.00 AC ACQ	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 21 E2NE,NW,NWSW,SEW, NESE; SEC. 29 NE,S2NW,NENW,SWSW, NESE,SWSE; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 21 SENE; SEC. 29 NWNW; TES 16-2 (ALL LANDS) TL 13-3 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 21 E2NE,NW,NWSW,SEW, NESE; SEC. 29 NE,S2NW,NENW,SWSW, NESE,SWSE; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 21 SENE; SEC. 29 NWNW; TES 16-2 (ALL LANDS) TL 13-3 (ALL LANDS)	

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-W8	T. 14 N, R. 45 E, PMM, MT SEC. 22 E2NE,E2SW,SE; SEC. 27 ALL; SEC. 28 W2NE,NENW,SW,NWSE; PRAIRIE COUNTY 1280.00 AC ACQ	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 22 N2SE; SEC. 27 NWSW,SESW; SEC. 28 SWNE,NWSE; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 27 NESE; NSO 11-4 SEC. 27 S2NE,SENE,SWSW, E2SW,W2SE,NESE; TES 16-2 (ALL LANDS) TL 13-3 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 22 N2SE; SEC. 27 NWSW,SESW; SEC. 28 SWNE,NWSE; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 27 NESE; NSO 11-4 SEC. 27 S2NE,SENE,SWSW, E2SW,W2SE,NESE; TES 16-2 (ALL LANDS) TL 13-3 (ALL LANDS)	
MTM 102757-W7	T. 14 N, R. 45 E, PMM, MT SEC. 22 W2NE,NW,W2SW; SEC. 26 NE,W2W2; PRAIRIE COUNTY 640.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 22 NENW; SEC. 26 SWNE,W2NW,SWSW; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-4 SEC. 26 W2NE,SENE; TES 16-2 (ALL LANDS) TL 13-3 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 22 NENW; SEC. 26 SWNE,W2NW,SWSW; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-4 SEC. 26 W2NE,SENE; TES 16-2 (ALL LANDS) TL 13-3 (ALL LANDS)	

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-W9	T. 14 N, R. 45 E, PMM, MT SEC. 23 ALL; SEC. 24 E2; SEC. 26 E2W2,SE; PRAIRIE COUNTY 1280.00 AC ACQ	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 23 SENE,NENW; SEC. 24 NE,SESE; SEC. 26 SENW,NESW,N2SE,SWSE; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 23 E2NE; SEC. 24 NESE,S2SE; SEC. 26 SENW,E2SW,SE; NSO 11-4 SEC. 24 W2NE,SENE,W2SE,NESE; SEC. 26 E2NW,NESW,N2SE; TES 16-2 (ALL LANDS) TL 13-3 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 23 SENE,NENW; SEC. 24 NE,SESE; SEC. 26 SENW,NESW,N2SE,SWSE; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 23 E2NE; SEC. 24 NESE,S2SE; SEC. 26 SENW,E2SW,SE; NSO 11-4 SEC. 24 W2NE,SENE,W2SE,NESE; SEC. 26 E2NW,NESW,N2SE; TES 16-2 (ALL LANDS) TL 13-3 (ALL LANDS)	
MTM 102757-XA	T. 14 N, R. 45 E, PMM, MT SEC. 30 LOTS 1-4; SEC. 30 N2NE,E2NW; PRAIRIE COUNTY 318.24 AC PD	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 30 LOT 1; SEC. 30 NWNE,NENW; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) NSO 11-2 SEC. 30 LOTS 1,2,4; NSO 11-8 SEC. 30 LOT 1; TES 16-2 (ALL LANDS) TL 13-1 SEC. 30 LOTS 3,4; TL 13-3 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 30 LOT 1; SEC. 30 NWNE,NENW; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) NSO 11-2 SEC. 30 LOTS 1,2,4; NSO 11-8 SEC. 30 LOT 1; TES 16-2 (ALL LANDS) TL 13-1 SEC. 30 LOTS 3,4; TL 13-3 (ALL LANDS)	

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-XB	T. 14 N, R. 45 E, PMM, MT SEC. 31 LOTS 1-4; SEC. 31 E2,E2W2; SEC. 32 ALL; PRAIRIE COUNTY 1281.76 AC ACQ	CR 16-1 (ALL LANDS) LN 14-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 31 LOT 4; SEC. 31 SENE; SEC. 32 SWNW,SESW;S2SE; NSO 11-4 SEC. 32 W2NE,NW,N2SW,NWSE; NSO 11-8 SEC. 32 SESE; TES 16-2 (ALL LANDS) TL 13-1 SEC. 31 LOTS 1-4; SEC. 31 S2NE,E2W2,SE; SEC. 32 SENE,SWNW,S2; TL 13-3 (ALL LANDS) TL 13-4 SEC. 31 SESE; SEC. 32 S2;	CR 16-1 (ALL LANDS) LN 14-1 (ALL LANDS) LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 31 LOT 4; SEC. 31 SENE; SEC. 32 SWNW,SESW;S2SE; NSO 11-4 SEC. 32 W2NE,NW,N2SW,NWSE; NSO 11-8 SEC. 32 SESE; TES 16-2 (ALL LANDS) TL 13-1 SEC. 31 LOTS 1-4; SEC. 31 S2NE,E2W2,SE; SEC. 32 SENE,SWNW,S2; TL 13-3 (ALL LANDS) TL 13-4 SEC. 31 SESE; SEC. 32 S2;	

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-XC	T. 14 N, R. 45 E, PMM, MT SEC. 34 ALL; PRAIRIE COUNTY 640.00 AC ACQ	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 34 N2NW; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-4 SEC. 34 W2NE,NW,N2SW, SESW,SE; TES 16-2 (ALL LANDS) TL 13-1 SEC. 34 S2NE,S2NW,S2; TL 13-3 (ALL LANDS) TL 13-4 SEC. 34 SESE;	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 34 N2NW; LN 14-11 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-4 SEC. 34 W2NE,NW,N2SW, SESW,SE; TES 16-2 (ALL LANDS) TL 13-1 SEC. 34 S2NE,S2NW,S2; TL 13-3 (ALL LANDS) TL 13-4 SEC. 34 SESE;	
MTM 102757-PD	T. 26 N, R. 45 E, PMM, MT SEC. 15 LOT 4; SEC. 15 NESW,S2SW; SEC. 16 SESE; MCCONE COUNTY 192.89 AC PD	CR 16-1 (ALL LANDS) CSU 12-1 (ALL LANDS) CSU 12-4 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 15 LOT 4; SEC. 15 NESW; NSO 11-9 (ALL LANDS) NSO 11-10 (ALL LANDS) NSO 11-13 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-1 (ALL LANDS) CSU 12-4 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 15 LOT 4; SEC. 15 NESW; NSO 11-9 (ALL LANDS) NSO 11-10 (ALL LANDS) NSO 11-13 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS)	

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-PE	T. 26 N, R. 45 E, PMM, MT SEC. 21 N2NE; MCCONE COUNTY 80.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-1 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-1 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS)	
MTM 102757-4P	T. 35 N, R. 48 E, PMM, MT SEC. 35 N2NW; DANIELS COUNTY 80.00 AC PD	CR 16-1 (ALL LANDS) CSU 12-1 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) TES 16-2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-1 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) TES 16-2 (ALL LANDS)	
MTM 102757-YM	T. 27 N, R. 57 E, PMM, MT SEC. 28 LOTS 1,5,8; SEC. 33 LOT 1; ROOSEVELT COUNTY 38.10 AC PD	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 28 LOTS 5,8; CSU 12-4 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 (ALL LANDS) NSO 11-9 (ALL LANDS) NSO 11-10 (ALL LANDS) NSO 11-13 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 28 LOTS 5,8; CSU 12-4 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 (ALL LANDS) NSO 11-9 (ALL LANDS) NSO 11-10 (ALL LANDS) NSO 11-13 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS)	
MTM 97300-OT	T. 20 N, R. 58 E, PMM, MT SEC. 1 TR 1 DESC BY M&B; RICHLAND COUNTY 4.87 AC ACQ	CR 16-1 (ALL LANDS) NSO 11-2 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	CR 16-1 (ALL LANDS) NSO 11-2 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFERRAL - NO LEASING
MTM 97300-OU	T. 20 N, R. 58 E, PMM, MT SEC. 11 TR 2 DESC BY M&B (1.90 AC); SEC. 11 TR 3 DESC BY M&B (0.98 AC); SEC. 11 TR 4 DESC BY M&B (11.45 AC); RICHLAND COUNTY 14.33 AC ACQ	CR 16-1 (ALL LANDS) NSO 11-2 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS) TL 13-4 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	CR 16-1 (ALL LANDS) NSO 11-2 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS) TL 13-4 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	
MTM 97300-OV	T. 20 N, R. 58 E, PMM, MT SEC. 15 TR 1 DESC BY M&B (0.02 AC); SEC. 15 TR 2 DESC BY M&B (7.86 AC); SEC. 15 TR 3 DESC BY M&B (16.96 AC); SEC. 15 TR 4 DESC BY M&B (5.90 AC); SEC. 15 TR 5 DESC BY M&B (9.20 AC); RICHLAND COUNTY 39.94 AC ACQ	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 15 TR 1 DESC BY M&B (0.02 AC); LN 14-15 (ALL LANDS) NSO 11-2 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 15 TR 1 DESC BY M&B (0.02 AC); LN 14-15 (ALL LANDS) NSO 11-2 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	
MTM 97300-OW	T. 21 N, R. 58 E, PMM, MT SEC. 33 TR 1 DESC BY M&B (1.34 AC); SEC. 33 TR 2 DESC BY M&B (7.57 AC); RICHLAND COUNTY 8.91 AC ACQ	CR 16-1 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	CR 16-1 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-3 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	
MTM 102757-Q3	T. 23 N, R. 59 E, PMM, MT SEC. 9 TR 1 DESC BY M&B (0.33 AC); SEC. 9 TR 2 DESC BY M&B (3.40 AC); SEC. 9 TR 3 DESC BY M&B (3.00 AC); SEC. 9 TR 4 DESC BY M&B (0.20 AC); RICHLAND COUNTY 6.93 AC ACQ	CR 16-1 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 (ALL LANDS) TES 16-2 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	CR 16-1 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 (ALL LANDS) TES 16-2 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	

APPENDIX A				
PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-Q4	T. 23 N, R. 59 E, PMM, MT SEC. 10 TR IN N2SW DESC BY M&B (0.23 AC); SEC. 10 TR IN N2SW DESC BY M&B (3.58 AC); RICHLAND COUNTY 3.81 AC ACQ	CR 16-1 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 (ALL LANDS) TES 16-2 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	CR 16-1 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 (ALL LANDS) TES 16-2 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	
MTM 102757-Q6	T. 23 N, R. 59 E, PMM, MT SEC. 15 TR IN SWNE DESC BY M&B (0.76 AC); SEC. 15 N 97.5 FT OF NWNW (2.95 AC); SEC. 15 TR IN N2SW DESC BY M&B (2.10 AC); SEC. 15 TR IN N2NESW DESC BY M&B (0.38 AC); SEC. 15 TR IN NESW DESC BY M&B (0.50 AC); SEC. 15 TR IN S2SW DESC BY M&B (1.50 AC); SEC. 15 TR IN S2SW DESC BY M&B (1.66 AC); RICHLAND COUNTY 9.85 AC ACQ	CR 16-1 (ALL LANDS) LN 14-15 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	CR 16-1 (ALL LANDS) LN 14-15 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	

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PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-Q7	T. 23 N, R. 59 E, PMM, MT SEC. 15 TR 1 DESC BY M&B (2.95 AC); SEC. 15 TR 2 DESC BY M&B (3.03 AC); SEC. 15 TR 3 DESC BY M&B (1.12 AC); SEC. 15 TR 4 DESC BY M&B (0.06 AC); SEC. 15 TR 5 DESC BY M&B (1.36 AC); SEC. 15 TR 6 DESC BY M&B (1.42 AC); SEC. 15 TR 7 DESC BY M&B (0.75 AC); RICHLAND COUNTY 10.69 AC ACQ	CR 16-1 (ALL LANDS) LN 14-15 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	CR 16-1 (ALL LANDS) LN 14-15 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	
MTM 102757-V3	T. 23 N, R. 59 E, PMM, MT SEC. 21 TR 1 IN SE DESC BY M&B (1.50 AC); SEC. 21 TR 2 IN SE DESC BY M&B (1.80 AC); SEC. 21 TR 3 IN SE DESC BY M&B (1.40 AC); RICHLAND COUNTY 4.70 AC ACQ	CR 16-1 (ALL LANDS) LN 14-15 (ALL LANDS) TES 16-2 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	CR 16-1 (ALL LANDS) LN 14-15 (ALL LANDS) TES 16-2 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	

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PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-V4	T. 23 N, R. 59 E, PMM, MT SEC. 23 TR 1 DESC BY M&B (5.82 AC); SEC. 23 TR 2 DESC BY M&B (3.22 AC); SEC. 23 TR 3 DESC BY M&B (8.36 AC); SEC. 23 TR 4 DESC BY M&B (1.68 AC); SEC. 23 TR 5 DESC BY M&B (4.02 AC); SEC. 23 TR 6 DESC BY M&B (1.04 AC); SEC. 23 TR 7 DESC BY M&B (2.42 AC); SEC. 23 TR 8 DESC BY M&B (4.27 AC); SEC. 23 TR 9 DESC BY M&B (2.76 AC); SEC. 23 TR 10 DESC BY M&B (1.96 AC); SEC. 23 TR 11 DESC BY M&B (3.33 AC); SEC. 23 TR 12 DESC BY M&B (0.43 AC); SEC. 23 TR 13 DESC BY M&B (2.31 AC); SEC. 23 TR 14 DESC BY M&B (2.11 AC); RICHLAND COUNTY 43.73 AC ACQ	CR 16-1 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 23 TR 2 DESC BY M&B (3.22 AC); SEC. 23 TR 3 DESC BY M&B (8.36 AC); SEC. 23 TR 4 DESC BY M&B (1.68 AC); SEC. 23 TR 5 DESC BY M&B (4.02 AC); SEC. 23 TR 6 DESC BY M&B (1.04 AC); SEC. 23 TR 7 DESC BY M&B (2.42 AC); SEC. 23 TR 8 DESC BY M&B (4.27 AC); SEC. 23 TR 13 DESC BY M&B (2.31 AC); NSO 11-9 SEC. 23 TR 4 DESC BY M&B (1.68 AC); SEC. 23 TR 5 DESC BY M&B (4.02 AC); SEC. 23 TR 6 DESC BY M&B (1.04 AC); SEC. 23 TR 7 DESC BY M&B (2.42 AC); NSO 11-10 SEC. 23 TR 4 DESC BY M&B (1.68 AC); SEC. 23 TR 5 DESC BY M&B (4.02 AC); SEC. 23 TR 6 DESC BY M&B (1.04 AC); SEC. 23 TR 7 DESC BY M&B (2.42 AC); TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-4 SEC. 23 TR 2 DESC BY M&B (3.22 AC); SEC. 23 TR 3 DESC BY M&B (8.36 AC); SEC. 23 TR 4 DESC BY M&B (1.68 AC); SEC. 23 TR 8 DESC BY M&B (4.27 AC); SEC. 23 TR 13 DESC BY M&B (2.31 AC);	CR 16-1 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 23 TR 2 DESC BY M&B (3.22 AC); SEC. 23 TR 3 DESC BY M&B (8.36 AC); SEC. 23 TR 4 DESC BY M&B (1.68 AC); SEC. 23 TR 5 DESC BY M&B (4.02 AC); SEC. 23 TR 6 DESC BY M&B (1.04 AC); SEC. 23 TR 7 DESC BY M&B (2.42 AC); SEC. 23 TR 8 DESC BY M&B (4.27 AC); SEC. 23 TR 13 DESC BY M&B (2.31 AC); NSO 11-9 SEC. 23 TR 4 DESC BY M&B (1.68 AC); SEC. 23 TR 5 DESC BY M&B (4.02 AC); SEC. 23 TR 6 DESC BY M&B (1.04 AC); SEC. 23 TR 7 DESC BY M&B (2.42 AC); NSO 11-10 SEC. 23 TR 4 DESC BY M&B (1.68 AC); SEC. 23 TR 5 DESC BY M&B (4.02 AC); SEC. 23 TR 6 DESC BY M&B (1.04 AC); SEC. 23 TR 7 DESC BY M&B (2.42 AC); TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-4 SEC. 23 TR 2 DESC BY M&B (3.22 AC); SEC. 23 TR 3 DESC BY M&B (8.36 AC); SEC. 23 TR 4 DESC BY M&B (1.68 AC); SEC. 23 TR 8 DESC BY M&B (4.27 AC); SEC. 23 TR 13 DESC BY M&B (2.31 AC);	
		BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	

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PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING IF EA INCLUDES ALTERNATIVE C	PROPOSED FOR DEFFERAL - NO LEASING
MTM 102757-6D	T. 23 N, R. 59 E, PMM, MT SEC. 23 TR 15 DESC BY M&B; RICHLAND COUNTY 2.7173 AC ACQ	CR 16-1 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 (ALL LANDS) NSO 11-9 (ALL LANDS) NSO 11-10 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-4 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	CR 16-1 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 (ALL LANDS) NSO 11-9 (ALL LANDS) NSO 11-10 (ALL LANDS) TES 16-2 (ALL LANDS) TL 13-1 (ALL LANDS) TL 13-4 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	
MTM 97300-0X	T. 23 N, R. 59 E, PMM, MT SEC. 29 TR 1 DESC BY M&B (4.96 AC); SEC. 29 TR 2 DESC BY M&B (4.54 AC); SEC. 29 TR 3 DESC BY M&B (10.04 AC); SEC. 29 TR 4 DESC BY M&B (1.79 AC); SEC. 29 TR 5 DESC BY M&B (8.03 AC); SEC. 29 TR 6 DESC BY M&B (3.56 AC); SEC. 29 TR 7 DESC BY M&B (.76 AC); SEC. 29 TR 8 DESC BY M&B (0.70 AC); SEC. 29 TR 9 DESC BY M&B (2.40 AC); RICHLAND COUNTY 36.78 AC ACQ	CR 16-1 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 29 TR 1 DESC BY M&B (4.96 AC); SEC. 29 TR 2 DESC BY M&B (4.54 AC); SEC. 29 TR 3 DESC BY M&B (10.04 AC); SEC. 29 TR 4 DESC BY M&B (1.79 AC); SEC. 29 TR 5 DESC BY M&B (8.03 AC); SEC. 29 TR 6 DESC BY M&B (3.56 AC); SEC. 29 TR 7 DESC BY M&B (.76 AC); TES 16-2 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	CR 16-1 (ALL LANDS) LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 29 TR 1 DESC BY M&B (4.96 AC); SEC. 29 TR 2 DESC BY M&B (4.54 AC); SEC. 29 TR 3 DESC BY M&B (10.04 AC); SEC. 29 TR 4 DESC BY M&B (1.79 AC); SEC. 29 TR 5 DESC BY M&B (8.03 AC); SEC. 29 TR 6 DESC BY M&B (3.56 AC); SEC. 29 TR 7 DESC BY M&B (.76 AC); TES 16-2 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	
MTM 102757-V6	T. 23 N, R. 59 E, PMM, MT SEC. 31 TR IN SESE DESC BY M&B; RICHLAND COUNTY 1.85 AC ACQ	CR 16-1 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 (ALL LANDS) TES 16-2 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	CR 16-1 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 (ALL LANDS) TES 16-2 (ALL LANDS) BOR 17-1 (ALL BOR LANDS) BOR 17-2 (ALL BOR LANDS)	

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MTM 102757-4R	T. 29 N, R. 59 E, PMM, MT SEC. 21 LOTS 1-4; ROOSEVELT COUNTY 71.84 AC PD	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 21 LOTS 1,2,3; LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 21 LOT 1; TES 16-2 (ALL LANDS)	CR 16-1 (ALL LANDS) CSU 12-1 SEC. 21 LOTS 1,2,3; LN 14-12 (ALL LANDS) LN 14-15 (ALL LANDS) NSO 11-2 SEC. 21 LOT 1; TES 16-2 (ALL LANDS)	

Appendix B – Miles City Field Office Stipulation Descriptions

Stipulation Number	Stipulation Name/Brief Description
CR 16-1	<p>CULTURAL RESOURCES LEASE STIPULATION</p> <p>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.</p>
CSU 12-1	<p>CONTROLLED SURFACE USE STIPULATION</p> <p>Surface occupancy or use is subject to the following special operating constraint: Prior to surface disturbance on slopes over 30 percent, an engineering/reclamation plan must be approved by the authorized officer.</p>
CSU 12-3	<p>CONTROLLED SURFACE USE STIPULATION</p> <p>Surface occupancy or use is subject to the following special operating constraint: Prior to surface disturbance, prairie dog colonies and complexes 80 acres or more in size will be examined to determine the absence or presence of black-footed ferrets. The findings of this examination may result in some restrictions to the operator's plans or may even preclude use and occupancy that would be in violation of the Endangered Species Act of 1973.</p>
CSU 12-4	<p>CONTROLLED SURFACE USE STIPULATION</p> <p>Surface occupancy or use is subject to the following special operating constraint: Prior to surface disturbance, a surface use plan of operations (SUPO) for oil and gas activities must be approved for black-footed ferret reintroduction areas by the authorized officer in consultation with the U.S. Fish and Wildlife Service (FWS).</p>
LN 14-1	<p>LEASE NOTICE</p> <p>Land Use Authorizations incorporate specific surface land uses allowed on Bureau of Land Management (BLM) administered lands by authorized officers and those surface uses acquired by BLM on lands administered by other entities. These BLM authorizations include rights-of-way, leases, permits, conservation easements, and recreation and public purpose leases and patents.</p>
LN 14-11	<p>LEASE NOTICE GREATER SAGE-GROUSE HABITAT</p> <p>The lease may in part, or in total contain important Greater Sage-Grouse habitats as identified by the BLM, either currently or prospectively. The operator may be required to implement specific measures to reduce impacts of oil and gas operations on the Greater Sage-Grouse populations and habitat quality. Such measures shall be developed during the application for permit to drill on-site and environmental review process and will be consistent with the lease rights granted.</p>
LN 14-12	<p>LEASE NOTICE PALEONTOLOGICAL RESOURCE INVENTORY REQUIREMENT</p> <p>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 meet the criteria for class 3, 4 and/or 5 as set forth in the Potential Fossil Yield Classification System, WO 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 WO IM 2008-009 dated October 15, 2007, and WO IM 2009-011 dated October 10, 2008.</p> <p>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, the lessee or project proponent will complete the inventory subject to the following:</p>

Stipulation Number	Stipulation Name/Brief Description
	<ul style="list-style-type: none"> • the project proponent must engage the services of a qualified paleontologist, acceptable to the BLM, to conduct the inventory. • 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. <p>paleontological inventory may identify resources that may require mitigation to the satisfaction of the BLM as directed by WO IM 2009-011. incorporate possible project relocation which may result from environmental or other resource considerations.</p> <p>paleontological inventory may identify resources that may require mitigation to the satisfaction of the BLM as directed by WO IM 2009-011.</p>
LN 14-15	<p>LEASE NOTICE SPRAGUE'S PIPIT</p> <p>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.</p> <p>If the US Fish and Wildlife Service lists the Sprague's pipit as threatened or endangered under Endangered Species Act, the 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.</p>
NSO 11-2	<p>NO SURFACE OCCUPANCY STIPULATION</p> <p>No surface occupancy or use is allowed within riparian areas, 100-year flood plains of major rivers, and on water bodies and streams.</p>
NSO 11-4	<p>NO SURFACE OCCUPANCY STIPULATION</p> <p>No surface occupancy or use is allowed within one-quarter mile of grouse leks.</p>
NSO 11-8	<p>NO SURFACE OCCUPANCY STIPULATION</p> <p>No surface occupancy or use is allowed within one-half mile of known ferruginous hawk nest sites which have been active within the past 2 years.</p>
NSO 11-9	<p>NO SURFACE OCCUPANCY STIPULATION</p> <p>No surface occupancy or use is allowed within one-quarter mile of wetlands identified as piping plover habitat.</p>
NSO 11-10	<p>NO SURFACE OCCUPANCY STIPULATION</p> <p>No surface occupancy or use is allowed within one-quarter mile of wetlands identified as interior least tern habitat.</p>
NSO 11-13	<p>NO SURFACE OCCUPANCY STIPULATION</p> <p>No surface occupancy or use is allowed within developed recreation areas and undeveloped recreation areas receiving concentrated public use.</p>
TES 16-2	<p>ENDANGERED SPECIES ACT SECTION 7 CONSULTATION STIPULATION</p> <p>The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development, 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.</p>
TL 13-1	<p>TIMING LIMITATION STIPULATION</p> <p>No surface use is allowed within crucial winter range for wildlife for the time period December 1 to March 31 to protect crucial white-tailed deer, mule deer, elk, antelope, moose, bighorn sheep, and sage grouse winter range from disturbance during the winter use season, and to facilitate long-term maintenance of wildlife populations. This stipulation does not apply to operation and maintenance of production facilities.</p>
TL 13-3	<p>TIMING LIMITATION STIPULATION</p> <p>No surface use is allowed from March 1 to June 15 in grouse nesting habitat within two miles of a lek. This stipulation does not apply to operation and maintenance of production</p>

Stipulation Number	Stipulation Name/Brief Description
	facilities.
TL 13-4	TIMING LIMITATION STIPULATION No surface use is allowed within one-half mile of raptor nest sites which have been active within the past 2 years during the time period March 1 - August 1 to protect nest sites of raptors which have been identified as species of special concern. This stipulation does not apply to operation and maintenance of production facilities.
BOR 17-1	BUREAU OF RECLAMATION - Agency lease stipulations.
BOR 17-2	BUREAU OF RECLAMATION - Agency special stipulations.

Appendix C – Reasonably Foreseeable Development (RFD) Scenario Forecast for the Area Analysis

The RFD is based on information contained in the MCFO RFD developed in 2005 and revised in 2012; it is an unpublished report that is available by contacting the MCFO. The RFD contains projections of the number of possible oil and gas wells that could be drilled and produced in the MCFO area and used to analyze projected wells for the 49 nominated lease parcels. These well numbers are only an estimate based on historical drilling and mineral resources present, and may change in the future if new technology is developed or new fields and formations are discovered.

A total of 49 lease parcels are located in Daniels, McCone, Richland and Sheridan Counties are proposed for the May, 2013 leases sale. The RFD contains projections of the number of possible oil and gas wells that could be drilled and produced in each of the three development potential areas where the proposed lease parcels are located. These development potential areas are specified as high, moderate, and low potential areas. Based on the development potential area boundaries some of the parcels may fall in more than one development area and have two different potential development scenarios.

High Potential

Of the 86,924 lease parcel acres located in whole or in part in Daniels, McCone, Richland, and Sheridan Counties, 5,282 parcel acres are in area of High Potential development. The RFD scenario forecasts a range of 711 to 1426 oil wells and 834 to 1674 gas wells in this development area. The range for federal wells is 165 to 331 oil wells and 194 to 388 gas wells. The High Potential lease parcels total approximately 5,282 acres, approximately 0.087 percent of the High Potential project area identified in the RFD.

Moderate Potential

Of the 86,237 lease parcels located in Daniels, McCone, Richland, and Sheridan Counties, 63,370 parcel acres are in whole or in part in the area of Moderate Potential development. All lease parcels with moderate potential are located in McCone County. The RFD scenario forecasts a range of 367 to 922 oil wells and 431 to 1083 gas wells in this development area. The range for federal wells is 85 to 214 oil wells and 100 to 251 gas wells. The Moderate Potential lease parcels total approximately 63,370 acres, approximately 0.95 percent of the Moderate Potential project area identified in the RFD.

Low Potential

Of the 86,237 lease parcels located in Daniels, McCone, Richland, and Sheridan Counties, 17,584 parcel acres are in whole or in part in the area of Low Potential development. All lease parcels with Low Potential are located in McCone County. The RFD scenario forecasts a range of 296 to 595 oil wells and 348 to 699 gas wells in this development area. The range for federal wells is 69 to 138 oil wells and 81 to 162 gas wells. The Low Potential lease parcels total approximately 17,584 acres, approximately 0.13 percent of the Low Potential project area identified in the RFD.

The MBOGC sets the spacing requirements for oil and gas wells in the state of Montana. Current well spacing for wildcat gas wells is set at 640 acres per well for each producing formation. For oil wells spacing is set based on the well depth. Currently, for oil wells set at a

depth between 0 and 6,000 feet the spacing is one well per 40 or 80 acres, for 6,001 to 11,000 feet the spacing is one well per 160 acres, and for wells greater than 11,001 feet in depth the spacing is one well per 320 acres. MBOGC also sets the spacing for CBNG wells, which is currently one well per 640 acres. In the case of CBNG, multiple wells within the standard 640-acre spacing unit are typically required to efficiently produce CNBG. The MBOGC will review spacing when a new field is discovered and the exploration company requests the establishment of permanent spacing unit that is different from the standard statewide spacing. Well spacing can be changed by the MBOGC after lease operators provide geologic, engineering, and economic data to the Board for review. A decision is generally rendered at a Board hearing and a Board Order is issued establishing the new spacing requirements. Board orders for existing fields are available on the MBOGC website.

Appendix D - Potential Surface Disturbance Associated with Oil & Gas Exploration and Development

The potential number of acres disturbed by exploration and development activities is shown in Table D-2. The potential acres of disturbance reflect acres typically disturbed by construction, drilling, and production activities, including infrastructure installation throughout the MCFO. Typical exploration and development activities and associated acres of disturbance were used as assumptions for analysis purposes in this EA. The assumptions were not applied to Alternative A because the lease parcel would not be recommended for lease; therefore, no wells would be drilled or produced on the lease parcel and no surface disturbance would occur on those lands from exploration and development activities.

Table D-1. Total RFD Projected Disturbance for Oil and Gas Wells and Associated Production Facilities

Facilities		Exploratory Well Disturbance (acres/well)	Construction Disturbance (acres/well)	Operation/Production Disturbance (acres/well)
		Short-Term – 2 Years		Long-Term
Well Pad (360-foot by 360-foot pad during drilling and construction reduced to 200-foot by 200 foot pad during operation)		3	3	1
Access Roads and Routes to Well Sites	Two-track (12-foot wide by 0.21 miles long)	N/A	0.30	0.30
	Graveled (12-foot wide by 0.075 miles long)	0.5	0.10	0.10
	Bladed (12-foot wide by 0.05 miles)	0.5	0.075	0.075
Utility Lines	Water lines (15-foot by 0.20 miles)	N/A	0.35	1
	Overhead Electric (10-foot by 0.15 miles)	N/A	0.20	0.20
	Underground Electric (15-foot by 0.20 miles)	N/A	0.35	0
Transportation Lines	Intermediate Pressure Gas Line to and from field compressor (25-foot by 0.08 miles)	N/A	0.25	0.001
	High Pressure Gas or Crude Oil Gathering Line (25-foot by 0.3 miles)	N/A	0.9	0.2
Processing Area	Tank Battery (one 0.50-acre tank battery per 12.5 wells)	N/A	0.020	0.04
	Access Roads (25-foot by 0.05 miles)	N/A	0.15	0.15
	Field Compressor (0.5-acre pad per 12.5 wells)	N/A	0.2	0.04
	Sales Compressor (2-acre pad for 240 wells)	N/A	0.01	0.01
	Sales Line (25-foot by 6 miles per 240 wells)	N/A	0.075	0.075
Produced Water Management	Produced Water Pipeline (25-foot by 0.3 miles)	N/A	0.9	0.2

	Water Plant/Injection Well (6 acres site per 12.5 wells)	N/A	0.25	0.5
Total Disturbance per Conventional Oil or Gas Well (acres)		4	7.1	3

Appendix E –Description of Lease Parcel ROW Encumbrances on BLM Surface

The following eight lease parcels with BLM administered surface have the following authorized BLM Rights-of Way (ROWs) on them:

MTM-102757-XF [640.00 Acres Acquired (LU) Federal Surface – Prairie County 320.00 Acres Fee Surface – Prairie County – Total 960.00 Acres]

MTM-55529 – McCone Electric Coop, Inc. – 20’ Overhead Power line ROW
[T13N, R45E, Section 12, SWNE, SWNW, N2SW]

MTM-99367 – Prairie County – 60’ Dead Man’s Road ROW
[T13N, R45E, Section 12, SWNE, SENW, NESW]

MTM-102757-WP [1,036.48 Acres Acquired (LU) Federal Surface – Prairie County]

MTM-55529 – McCone Electric Coop, Inc. – 20’ Overhead Power line ROW
[T13N, R45E, Section 5, NWSW, S2SW]

MTM-99354 – Prairie County – 60’ Cherry Creek Road ROW
[T13N, R45E, Section 5, Lots 3 and 4]

MTM-102757-X9 [1,281.21 Acres Acquired (LU) Federal Surface – Prairie County]

MTM-55529 – McCone Electric Coop, Inc. – 20’ Overhead Power line ROW
[T13N, R45E, Section 8, N2NE, SENE; Section 9, SW]

MTM-71919 – Mid Rivers Telephone Coop. – 20’ Buried Telephone Cable ROW
[T13N, R45E, Section 7, Lot 1]

MTM-99365 – Prairie County – 60’ Crow Rock Road ROW
[T13N, R45E, Section 7, E2NW]

MTM-102757-X8 [160.00 Acres Acquired (LU) Federal Surface – Prairie County]

MTM-55529 – McCone Electric Coop, Inc. – 20’ Overhead Power line ROW
[T13N, R45E, Section 12, SWSW]

MTM-99367 – Prairie County – 60’ Dead Man’s Road ROW
[T13N, R45E, Section 12, S2SW]

MTM-102757-YA [1,200.00 Acres Acquired (LU) Federal Surface – Prairie County]

MTM-55529 – McCone Electric Coop, Inc. – 20’ Overhead Power line ROW
[T13N, R45E, Section 15, SWNW, N2SW, SESW, SWSE; Section 22, N2NE, SENE, NESE]

MTM-102757-WR [960.00 Acres Acquired (LU) Federal Surface – Prairie County]

MTM-55529 – McCone Electric Coop, Inc. – 20’ Overhead Power line ROW
[T13N, R45E, Section 23, W2NW, N2SW, NWSE, S2SE]

MTM-99367 – Prairie County – 60’ Dead Man’s Road ROW
[T13N, R45E, Section 23, W2W2W2]

MTM-102757-XJ [320.00 Acres Acquired (LU) Federal Surface – Prairie County]

MTM-55529 – McCone Electric Coop, Inc. – 20’ Overhead Power line ROW
[T13N, R45E, Section 24, S2SW]

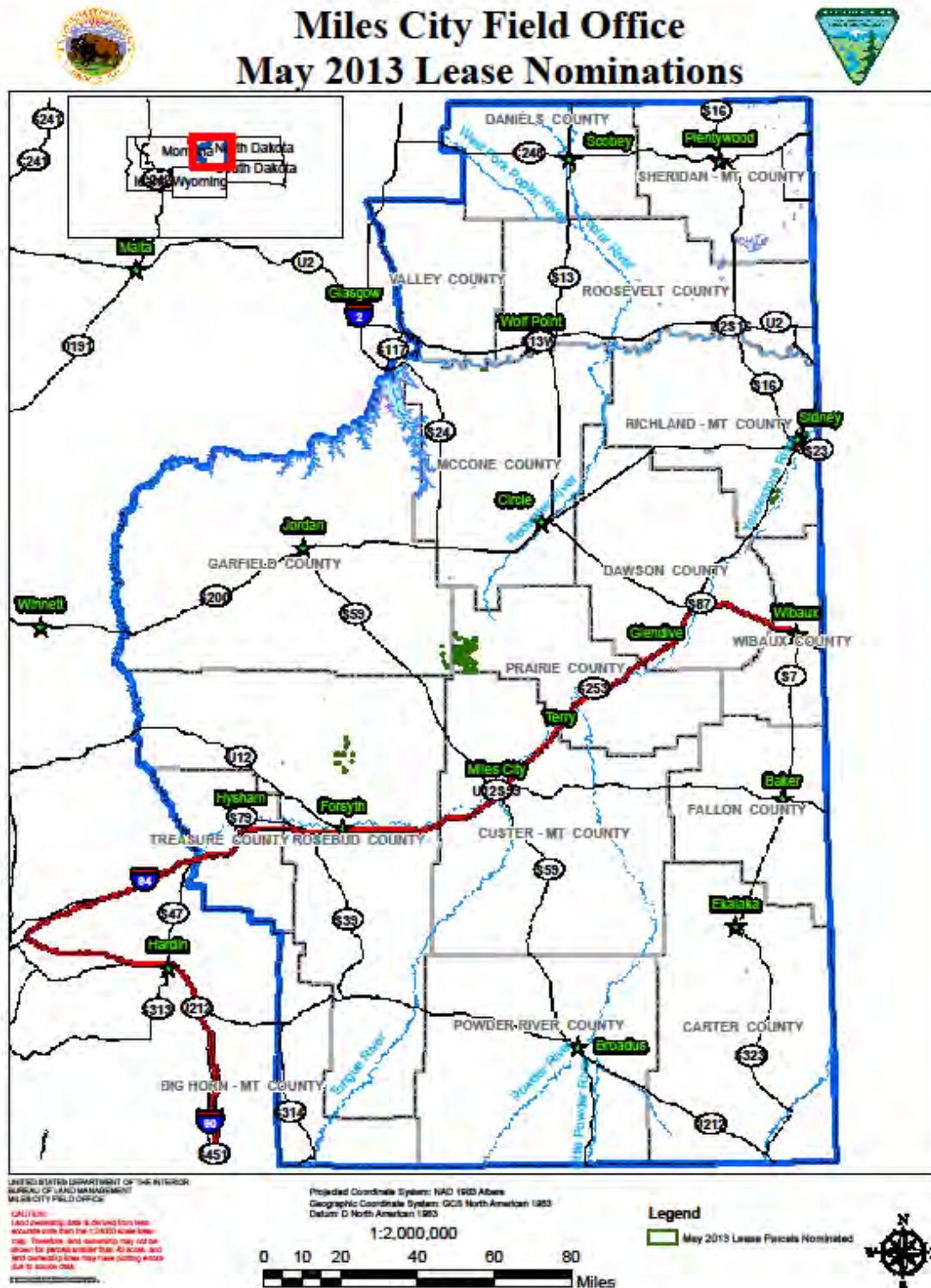
MTM-102757-XB [1,281.76 Acres Acquired (LU) Federal Surface – Prairie County]

MTM-99354 – Prairie County – 60’ Cherry Creek Road ROW
[T14N, R45E, Section 31, Lot 4, S2SESW, S2S2SE; Section 32, S2S2]

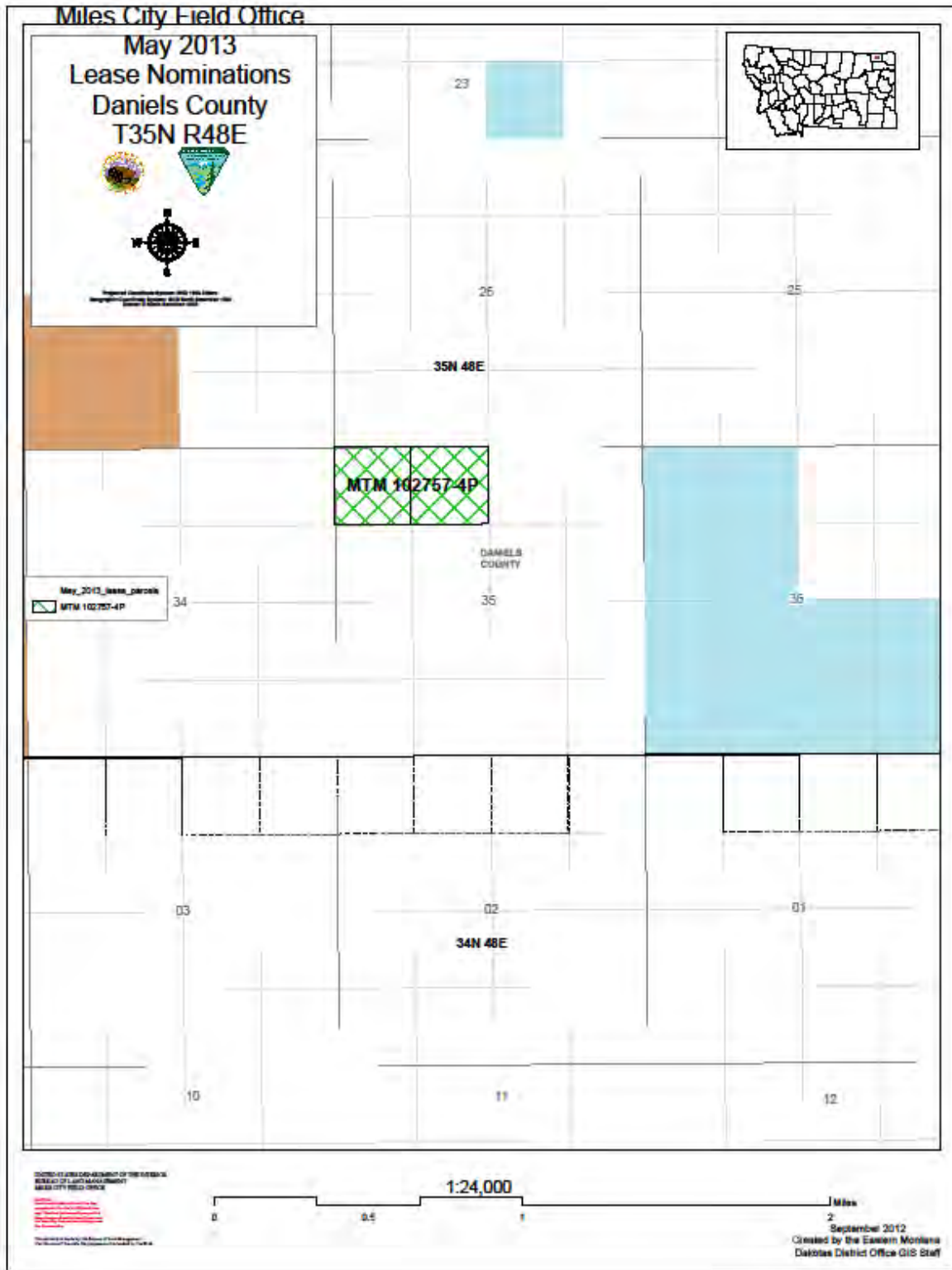
MTM-99365 – Prairie County – 60’ Crow Rock Road ROW
[T14N, R45E, Section 31, Lot 4]

TOTAL Affected Federal Lease Parcel	
Surveyed Acquired Federal Surface Acres	6,879.45
TOTAL Affected Federal Lease Parcel	
Surveyed Fee Surface Acres	<u>320.00</u>
TOTAL Lease Parcel Surveyed Surface Acres	<u>7,199.45</u>

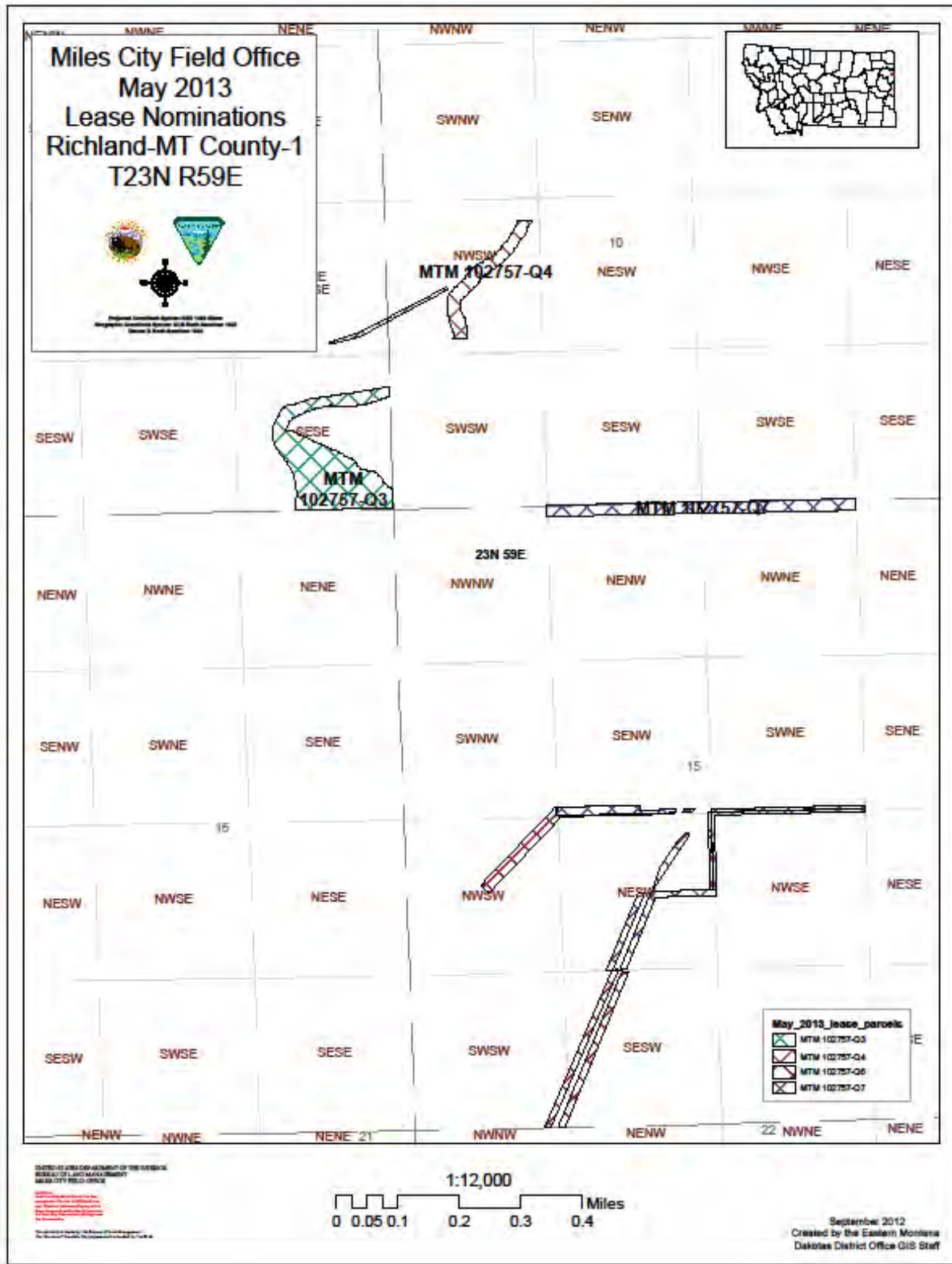
Map 1. All Nominated Lease Parcels



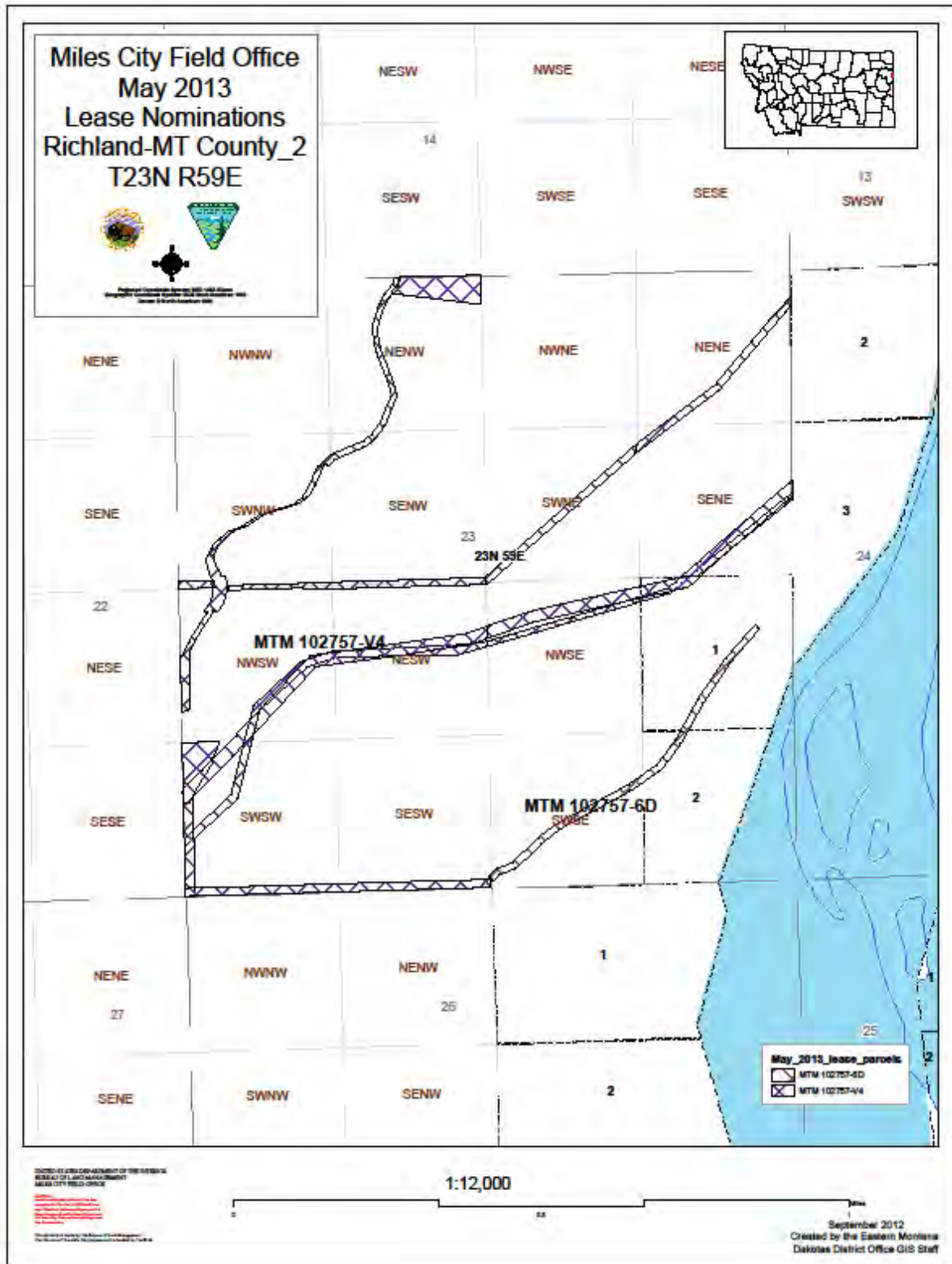
Map 2. Daniels County Lease Parcels



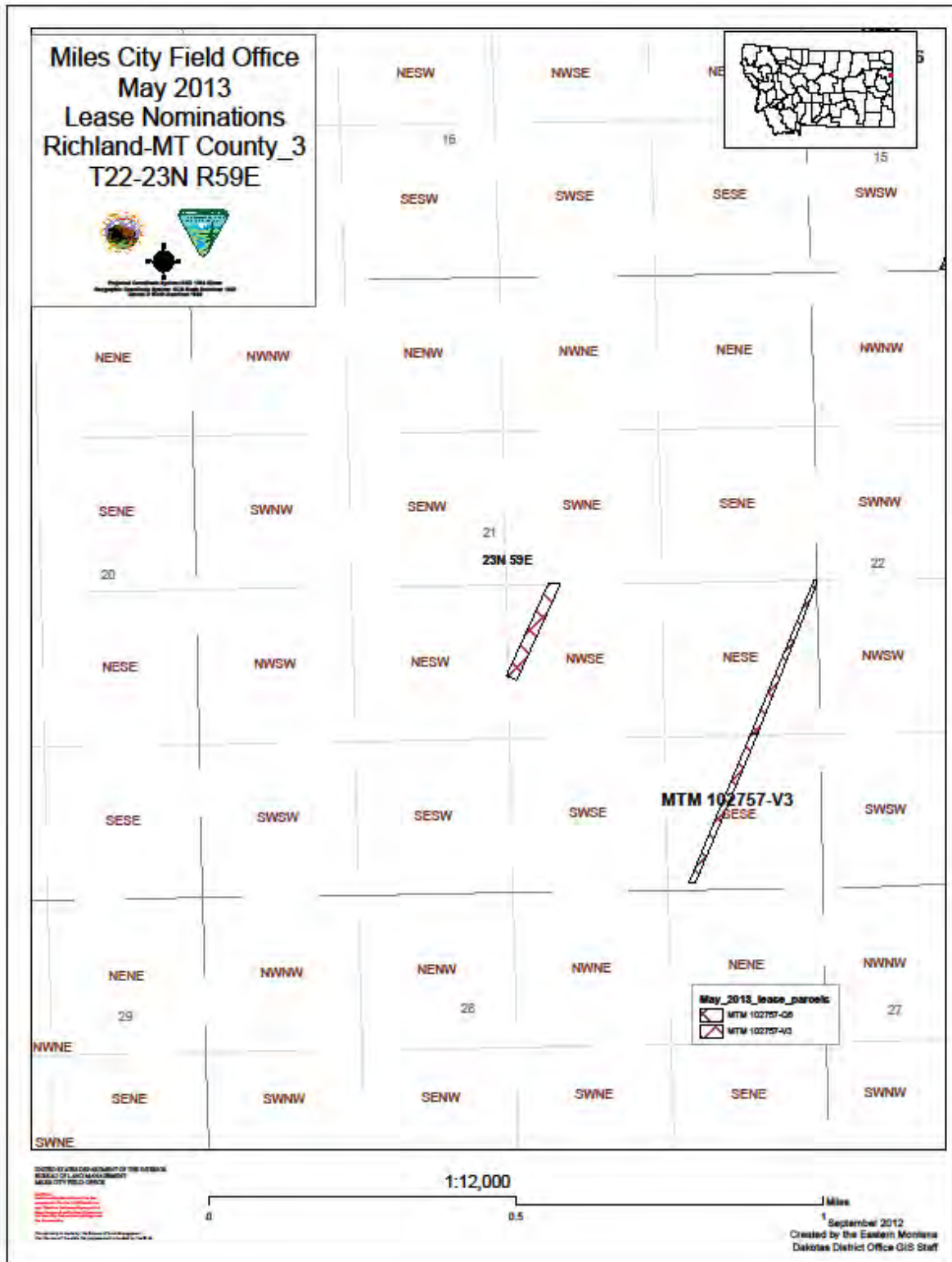
Map 3. Richland County Area #1 Lease Parcels



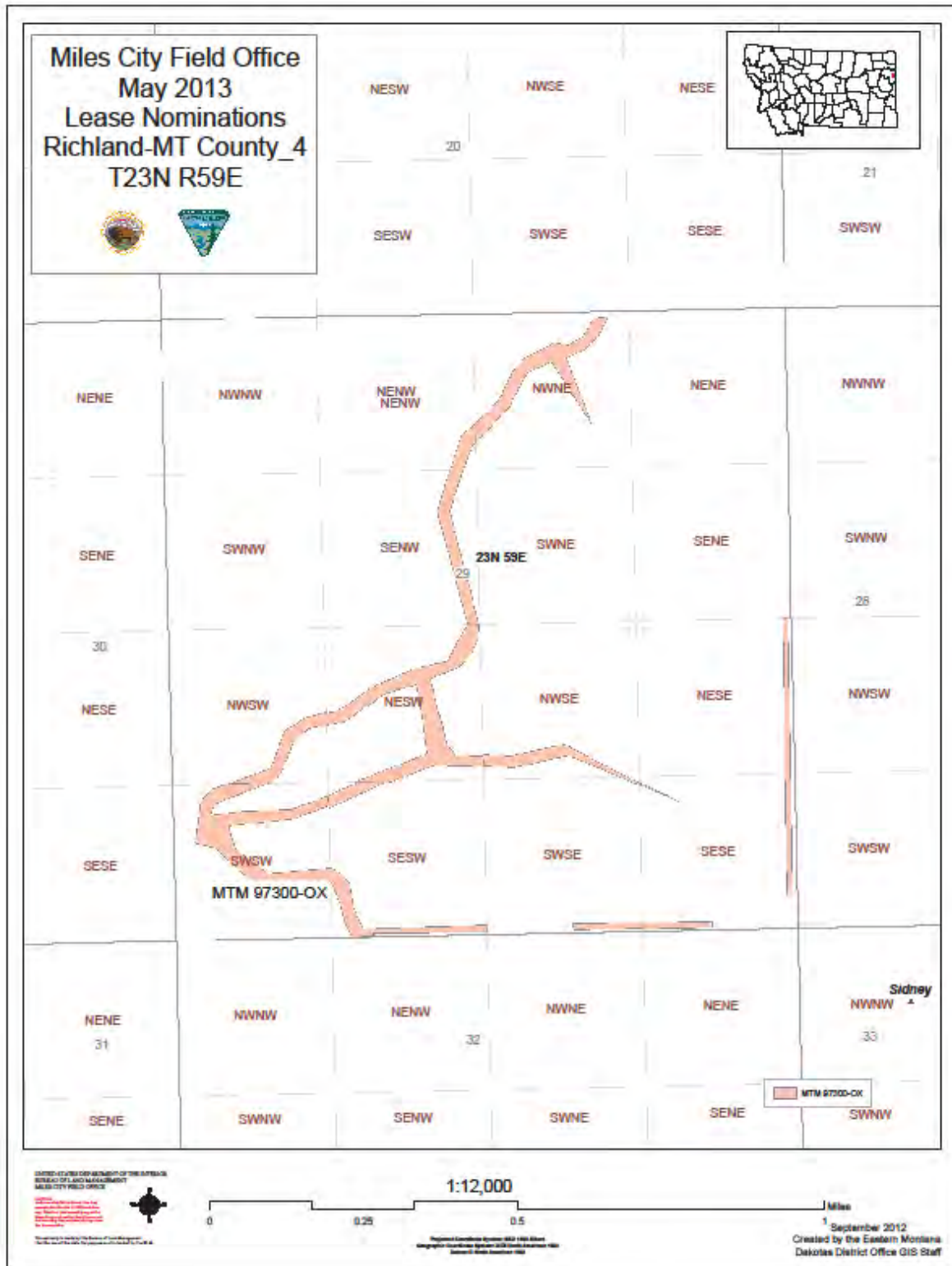
Map 4. Richland County Area #2 Lease Parcels



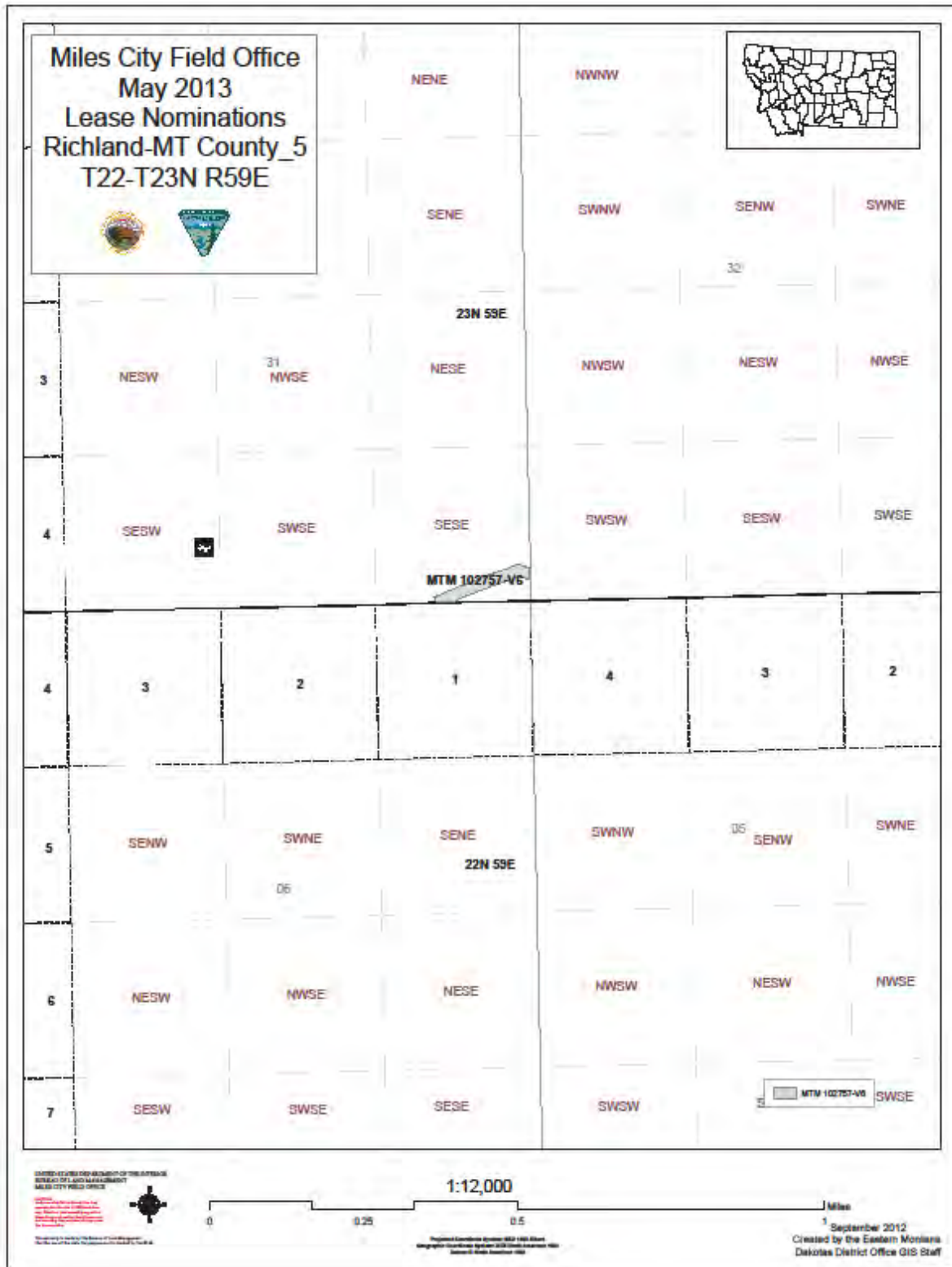
Map 5. Richland County Area #3 Lease Parcels



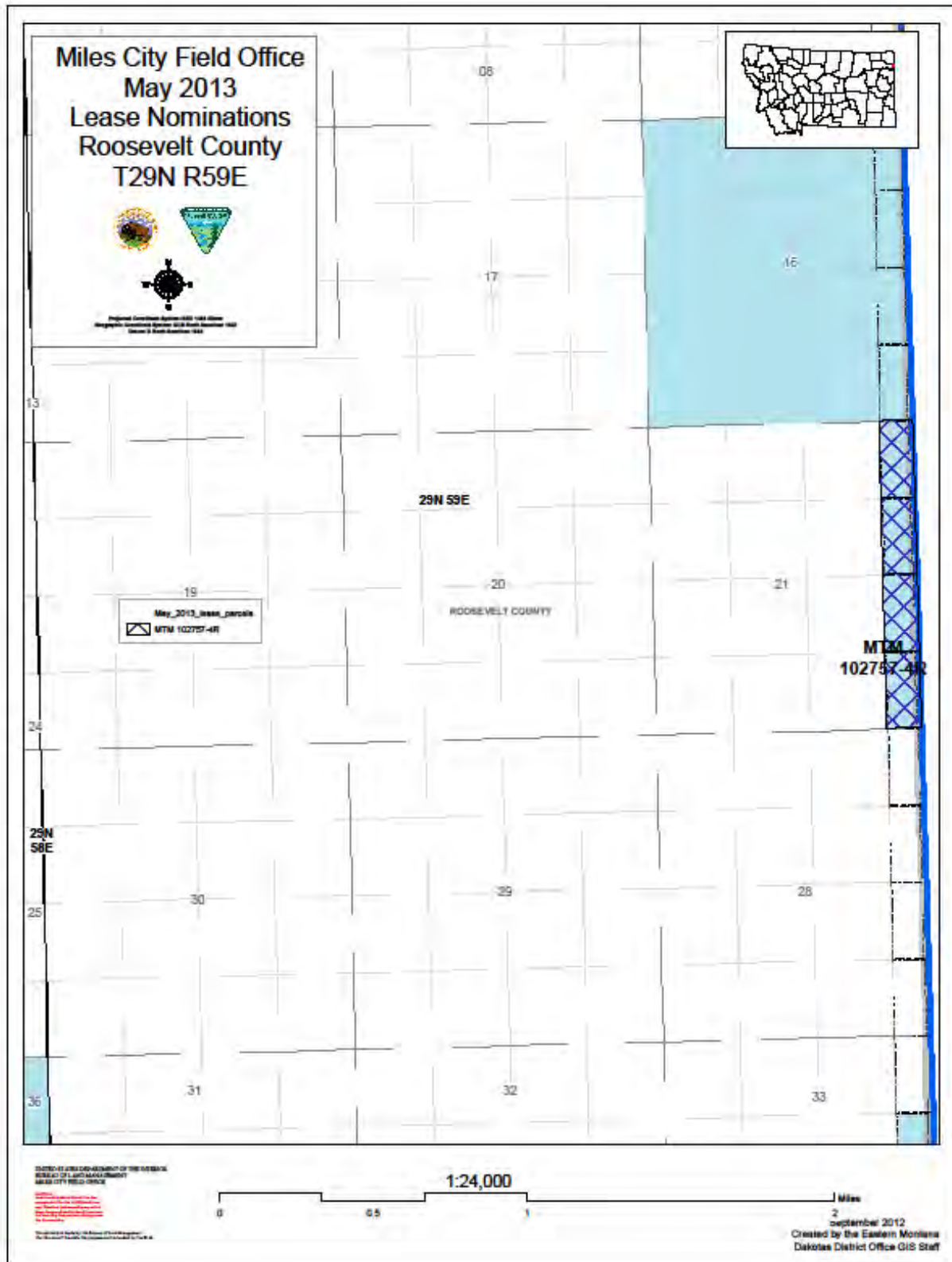
Map 6. Richland County Area #4 Lease Parcels



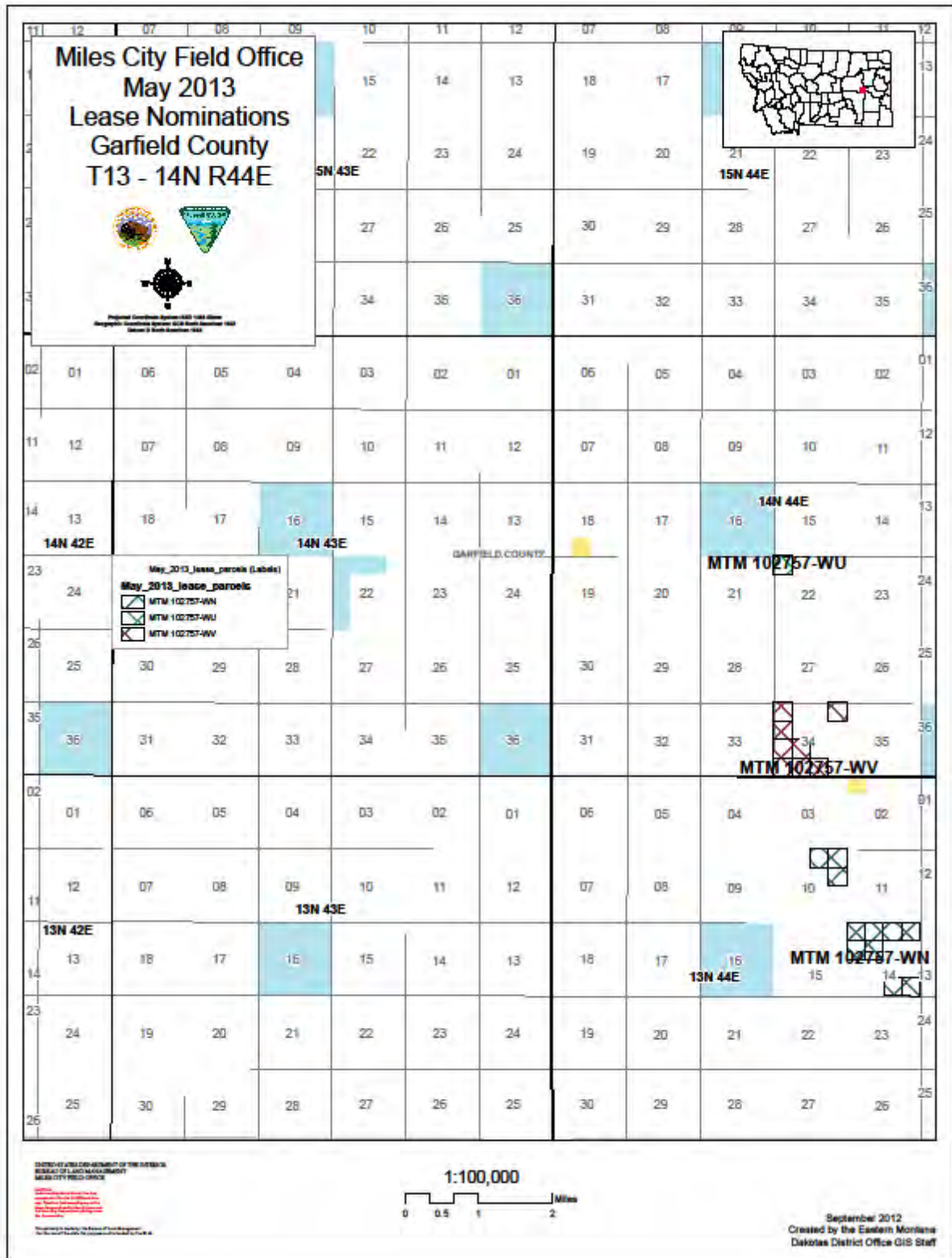
Map 7. Richland County Area #5 Lease Parcels



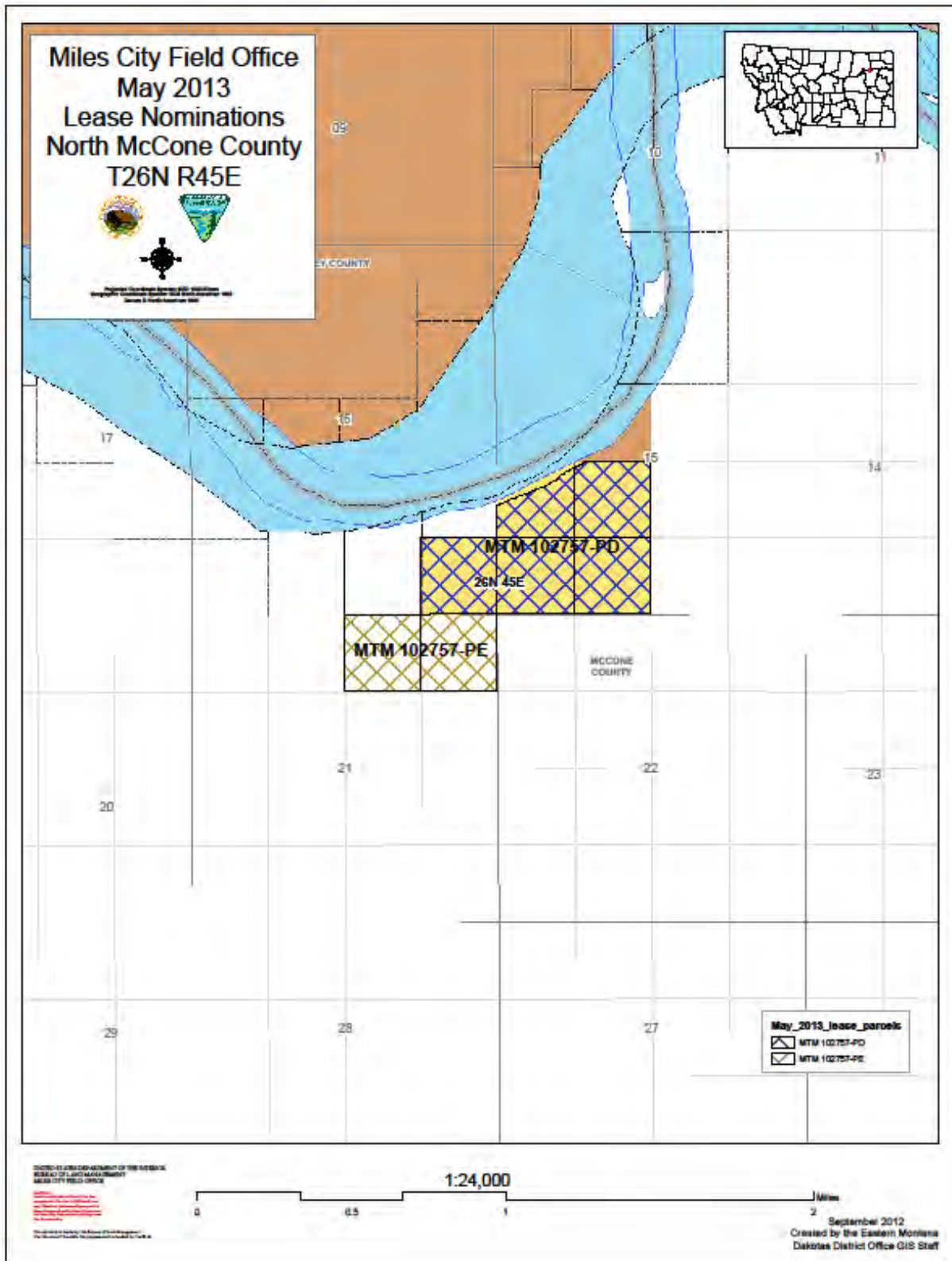
Map 8. Roosevelt County Lease Parcels



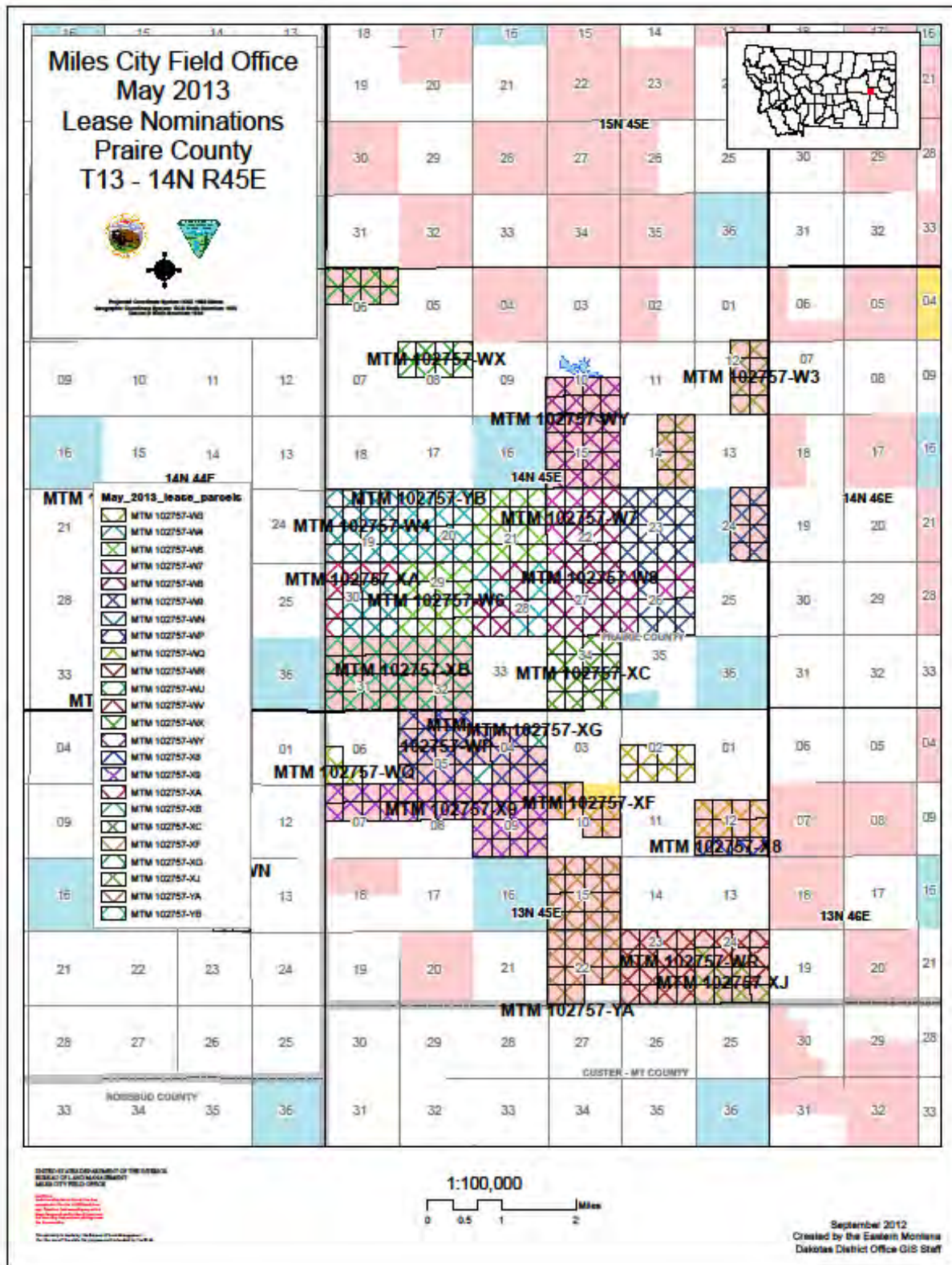
Map 9. Garfield County Lease Parcels



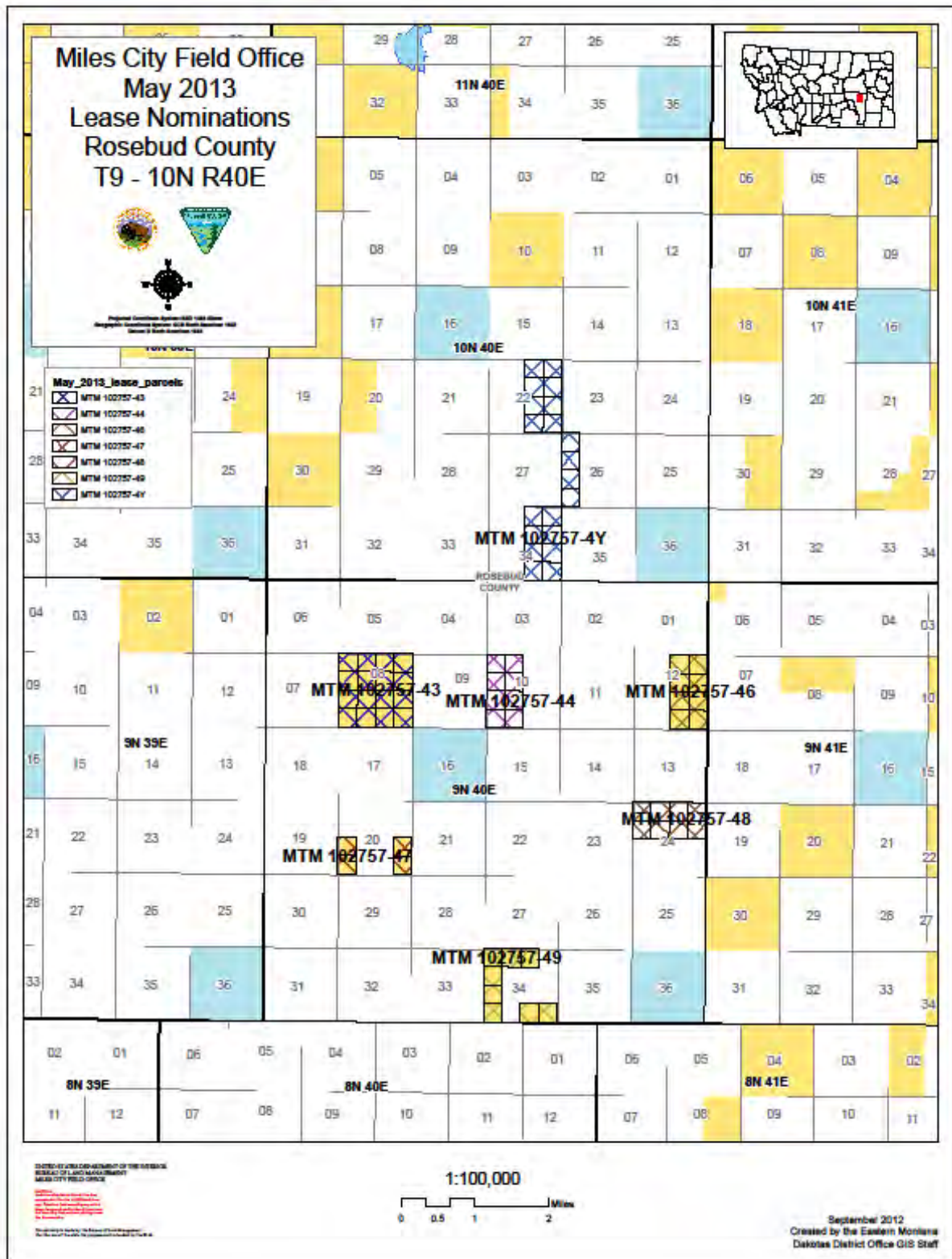
Map 10. North McCone County Lease Parcels



Map 11. Prairie County Lease Parcels



Map 12. Rosebud County Lease Parcels



Map 13. Deferred Lease Parcels

