United States Department of the Interior
Bureau of Land Management

Environmental Assessment
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High Plains District Portion of the August 2016 Lease Sale

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Chapter 1

1.1 Introduction

This environmental assessment (EA) has been prepared to disclose and analyze the environmental consequences beyond those already addressed in the Buffalo, Casper and Newcastle Field Offices' Resource Management Plans (RMP) and to address new information and policy for the Bureau of Land Management's (BLM) High Plains District (HPD) portion of the August 2016 Competitive Oil and Gas Lease Sale of which 43 parcels were nominated for leasing within the HPD.

EAs assist the BLM in project planning and compliance with the National Environmental Policy Act of 1969 (NEPA), as amended (Public Law 91-190, 42 U.S.C. 4321 *et seq*.). EAs also assist the authorized officer in making an informed determination as to whether any significant impacts could result from the analyzed actions. Significance is defined by the Council on Environmental Quality and is found in 40 CFR 1508.27.

An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or to support a Finding of No Significant Impact (FONSI). If the decision maker determines that this project has significant impacts following the analysis in the EA, then an EIS would be prepared for the project. A FONSI documents the reasons why implementation of the selected alternative would not result in "significant" environmental impacts (effects). When a FONSI[1] statement is reached, a Decision Record may be signed approving the selected alternative which could be the proposed action, another alternative, or a combination thereof.

1.2 Background

The BLM's policy derived from various laws, including the Mineral Leasing Act of 1920 (MLA), as amended [30 U.S.C. 181 *et seq*.] and the Federal Land Policy and Management Act of 1976 (FLPMA), as amended [43 U.S.C. 1701 *et seq*.], is to make mineral resources available for disposal and to encourage development of mineral resources to meet national, regional, and local needs.

As required under the MLA, the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (FOOGLRA), 43 CFR 3120.1-2(a) and BLM Instruction Memorandum No. WO-2010-117, the BLM Wyoming State Office (WSO) conducts a quarterly competitive lease sale to sell available oil and gas lease parcels. A Notice of Competitive Oil and Gas Lease Sale listing parcels to be offered at the auction is published by the WSO typically 90 days before the auction is held. Lease stipulations applicable to each parcel are specified in the sale notice. The decision as to which public lands and minerals are open for leasing and what leasing stipulations may be necessary, based on information available at the time, is made during the land use planning process. Surface management of non-BLM administered land overlaying Federal minerals is

[1] Since the RMP EISs have already evaluated potentially significant impacts arising from the BLM's land use planning decisions, the BLM anticipates a "finding of no new significant impacts." See 43 CFR 46.140(c).

determined by the BLM in consultation with the appropriate surface management agency or the private surface owner.

As part of the August 2016 Lease Sale preparation process the WSO submitted the preliminary parcel list to the HPD, which includes the Buffalo Field Office (BFO), the Casper Field Office (CFO) and the Newcastle Field Office (NFO), for review and processing. The BFO did not have any parcels nominated for the August 2016 Competitive Oil and Gas Lease Sale.

The RMPs for the Casper and Newcastle field offices have undergone amendment as part of the Wyoming Greater Sage-Grouse Land Use Plan Amendment. The Proposed Amendments and Final EIS were released on May 28, 2015. On September 21, 2015, the BLM signed a ROD and Approved Resource Management Plan Amendments for the Rocky Mountain Region, including the Casper and Newcastle RMPs, and on September 24, 2015, these documents were published in the Federal Register (80 FR 57639). On September 21, 2015, the BLM signed a Record of Decision (ROD) for the Buffalo Field Office Approved Resource Management Plan, and on September 24, 2015, these documents were published in the Federal Register (80 FR 57639).

The respective field office staffs, in coordination and consultation with the HPD staff, reviewed the parcels to determine if they are in areas open to leasing. Each field office made recommendations to the HPD. These recommendations were reviewed, and where appropriate, RMP based stipulations were included or additional RMP stipulations added; determined if new information is available since the land use plan was approved; determined if appropriate consultations have been conducted or if additional consultations are needed; and if there were special resource conditions of which potential bidders should be made aware. This single comprehensive EA was prepared by the HPD to document this review, as well as to disclose the affected environment, the anticipated impacts, the mitigation of impacts, and the recommended lease parcel disposition for all field offices. This EA will be available to the public for review for 30 days. Substantive comments and responses to those comments will be found in Appendix F of this document, once public comments are received and addressed. Public comments will be reviewed and taken into consideration in the completion of the decision record. A Notice of Competitive Oil and Gas Lease Sale listing parcels with stipulations to be offered at the auction is made available to the public typically 90 days before the auction is held.

This EA documents the HPD, the CFO and the NFO review of 43 parcels nominated for the August 2016 Competitive Oil and Gas Lease Sale, containing 22,895 Federal mineral acres and 2,391 Federal surface acres as depicted in Table 1.1 below (see also Appendix C, Preliminary Parcel List).

Table 1.1 Federal Mineral Acres & Federal Surface Acres

Field Office	Number Parcels	Federal Mineral Acres	Federal Surface Acres
Buffalo Field Office	0	0	0
Casper Field Office	9	5,402	120
Newcastle Field	34	17,493	2,271
Total	43	22,895	2,391

Two parcels, WY-1608-027 and WY-1608-039, comprising 120.00 acres in the CFO are deferred because they are Forest Service surface (Table 1.2). These parcels are deferred until completion of a BLM/Forest Service Leasing EA.

Table 1.2 BLM Deferrals due to Forest Service Surface

Parcel Number	Reason Deferred	Field Office	Partial or Entire Deferral	Deferred Acres
WY-1608-027	Forest Service Surface	Casper Field Office	Entire Parcel	40.00 acres
WY-1608-039	Forest Service Surface	Casper Field Office	Entire Parcel	80.00 acres
			Total Acres Deferred	**120.00 acres**

After careful review of the parcels, the BLM has determined that it was appropriate to defer certain parcels nominated for inclusion in the August 2016 oil and gas lease sale (Table 1.3). These deferrals of certain nominated parcels were made consistent with the BLM's sage-grouse conservation plans and strategy, which direct the BLM to prioritize oil and gas leasing and development in a manner that minimizes resource conflicts in order to protect important habitat and reduce development time and costs.

Table 1.3 BLM Deferrals due to Greater Sage-grouse Concerns

Parcel Number	Reason Deferred	Field Office	Partial or Entire Deferral	Legal Description of Deferred Acres
WY-1608-017	Sage-grouse	Newcastle Field Office	Entire Parcel	80.00 acres
WY-1608-024	Sage-grouse	Newcastle Field Office	Partial Parcel	40.00 acres, T.0440N, R.0660W, 06th PM, WY Sec. 029 SWSE
WY-1608-043	Sage-grouse	Casper Field Office	Entire Parcel	160.00 acres
			Total Acres Deferred	**280.00 acres**

In total, 43 parcels containing 22,895 acres located within the field offices in the HPD were nominated through “Expressions of Interest” for the August 2016 Competitive Oil and Gas Lease Sale, which are available for leasing through the applicable RMPs. For the reasons identified above, the BLM exercised its discretion to defer 4 entire parcels and 1 partial parcel containing 400 acres. As result of these deferrals, this EA analyzes 39 parcels containing 22,495 Federal

mineral acres and 2,271 Federal surface acres located within the HPD as depicted in Table 1.4 below.

Table 1.4 Federal Mineral Acres & Federal Surface Acres Remaining for EA Analysis

Field Office	Number Parcels	Federal Mineral Acres	Federal Surface Acres
Buffalo Field Office	0	0	0
Casper Field Office	6	5,122	0
Newcastle Field Office	33	17,373	2,271
Total	**39**	**22,495**	**2,271**

This EA also serves to verify conformance with the approved Casper and Newcastle RMPs and provides the rationale for attaching stipulations to specific parcels, offering a parcel for lease, deferring a parcel or deleting a parcel from the lease sale.

1.3 Purpose and Need

The purpose of the competitive oil and gas lease sale is to meet the growing energy demands of the United States public through the sale and issuance of oil and gas leases. Continued sale and issuance of leases is necessary to maintain economical production of oil and gas reserves owned by the United States.

The need for the competitive oil and gas lease sale is established by the FOOGLRA to respond to Expressions of Interest (EOI), the FLPMA, and the MLA. The BLM's responsibility under the MLA is to promote the development of oil and gas on the public domain, and to ensure that deposits of oil and gas owned by the United States are subject to disposition in the form and manner provided by the MLA under the rules and regulations prescribed by the Secretary of the Interior, where applicable, through the land use planning process.

Decision to be Made: The BLM will decide whether or not to offer and lease the nominated parcels of the HPD portion at the August 2016 Competitive Oil and Gas Lease Sale and if so, under what terms and conditions.

1.4 Conformance with BLM Land Use Plan(s)

Pursuant to 40 CFR 1508.28 and 1502.21, this EA tiers to and incorporates by reference the information and analysis contained in the following plans:

> The Proposed Resource Management Plan and Final Environmental Impact Statement for the Casper Field Office Planning Area (June 2007) and the RMP/ROD approved on December 7, 2007, as amended by the Wyoming Greater Sage-Grouse Proposed Land Use Plan Amendment and Final Environmental Impact Statement (May 2015), and the RMP/ROD approved on September 21, 2015.

The Final Environmental Impact Statement for the Newcastle Resource Management Plan (June 1999) and the RMP/ROD approved on August 25, 2000, as amended by the Wyoming Greater Sage-Grouse Proposed Land Use Plan Amendment and Final Environmental Impact Statement (May 2015), and the RMP/ROD approved on September 21, 2015.

Casper RMP/ROD: According to the Casper RMP/ROD, page 2-15, Goal MR: 2.1 states, "Maintain oil and gas leasing, exploration, and development, while minimizing impacts to other resource values;" decision 2002, "Parcels nominated for potential oil and gas leasing will be reviewed. Any stipulations attached to these parcels will be the least restrictive needed to protect other resource values;" and decision 2004, "The Casper Field Office is open to mineral leasing, including solid leasables and geothermal, unless specifically identified as administratively unavailable for the life of the plan for mineral leasing. These open areas will be managed on a case-by-case basis."

Newcastle RMP/ROD: According to the Newcastle RMP/ROD, page 12, "Management Actions: Federal oil and gas leases will be issued with appropriate stipulations for protection of other resource values."

The Casper and Newcastle RMPs (as amended) provide specific stipulations that would be attached to new leases offered in certain areas or affecting particular resources. These stipulations will be detailed further in this EA.

1.5 Relationship to Statutes, Regulations, or Other Plans

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

CFO and NFO wildlife biologists reviewed each parcel during the individual field office review. Individual parcels may contain threatened, endangered, candidate, or BLM sensitive species (EA Section 3.0, Affected Environment; Appendix A, Affected Environment Tables). The administrative act of offering and subsequent issuance of oil and gas leases is consistent with the decisions in the Casper and Newcastle RMPs, including decisions relating to threatened, endangered, candidate, and BLM sensitive species. The proposed action of offering and issuing oil and gas leases is also consistent with the biological assessments and biological opinions for these RMPs. No further consultation with the U. S. Fish and Wildlife Service (FWS) is required.

The WSO sent the preliminary parcel list to the Wyoming Game and Fish Department (WGFD). Each BLM field office sent a revised preliminary parcel list to WGFD field personnel. WGFD field personnel had 3 weeks to review the revised preliminary parcel list and send their comments back to the BLM field office. If WGFD field personnel did not have any comments or concerns with the revised preliminary parcel list, they sent an email/letter to the BLM field office that they have reviewed the revised preliminary parcel list, and the WGFD concerns have been met and they have no additional concerns. The BLM field office reviewed WGFD field personnel concerns and addressed their comments. See Table 5.1 for a list of all Persons, Agencies and Organizations consulted for purposes of this EA.

Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to take into account the effects of their undertakings on historic properties (sites that are listed on or eligible for listing on the National Register of Historic Places). Oil and gas leasing is a Federal undertaking which requires compliance with Section 106. Fluid mineral leasing implies surface disturbance which could adversely affect historic properties when parcels are developed, although the exact nature of that disturbance is not known until a site specific plan is submitted to the BLM, which can occur several years after the parcel is leased. Typically, the HPD meets its compliance with Section 106 of the NHPA for oil and gas leasing and development through a phased approach, which has three distinct decisions – land use planning, leasing, and development. At each phase the BLM narrows its focus as relevant to the action being analyzed, going from large land use areas potentially subject to leasing, to particular parcels to be leased, and then to the site-specific development decisions in which surface-disturbing activities may be approved.

In relation to fluid mineral leasing, the first phase of Section 106 compliance takes place during the land use planning process. RMP creation and land use planning decisions are made in consultation with the State Historic Preservation Officer (SHPO), tribes, cooperating agencies, and other interested parties. During the land use planning process, the BLM seeks to identify and inventory historic properties, including traditional cultural properties (TCP) significant to tribes, through consultation. The RMP for each field office describes and analyzes, on a very broad scale, potential impacts to known historic properties and includes management decisions that may protect historic properties through closures of certain areas to leasing or the formulation of protective lease stipulations. Surface use restrictions such as controlled surface use (CSU) or no surface occupancy (NSO) lease stipulations are also delineated in RMPs. The analysis performed during the RMP process is intended to identify and protect known historic properties that cannot be readily mitigated and due to its wide-ranging scale, does not include an intensive site specific field inventory component.

The second phase takes place as part of the BLM's process of deciding whether to include individual fluid mineral lease parcels in competitive lease sales in areas that are designated as "open" through the RMP process. This analysis is often done in the context of a NEPA document, such as this EA, and in consultation with the SHPO, tribes, cooperating agencies, and other interested parties. The HPD analyzes available information, including but not limited to, information gathered and considered during the RMP process, for each parcel to consider whether the sale will result in "adverse effects" and to ensure that adequate lease stipulations are included. In some cases, the analyses in the RMPs may be dated or may not have considered new information on historic properties or recent changes to law, regulation or policy. The analysis in the second phase also considers any new information related to historic properties in the potential lease parcels. This phase, in part, is intended to identify historic properties that cannot be readily mitigated and to identify parcels that the BLM may need to defer or delete from leasing lists. Depending on the particular resources identified, this analysis may not require intensive field inventory, especially in light of the uncertainty regarding the type and extent of surface disturbance associated with oil and gas development associated with a parcel. The BLM will include the following cultural resource lease stipulation on any parcel it decides to offer:

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

The third phase involves the approval process for an Application for Permit to Drill (APD) or other site-specific activities related to oil and gas development. At this stage, a project proponent submits a site specific plan to the field office detailing all proposed activities. The BLM must analyze the potential effects that such activities could have on historic properties. Utilizing historic property information gathered through the two previous stages, the BLM will seek to conduct, as appropriate, site-specific cultural resource inventories, gather additional information through consultation with SHPOs, tribes, and other interested parties, as well as the public, make eligibility determinations, analyze the potential effects and make adverse effect determinations, and seek to resolve any adverse effects through consultation. Completion of the Section 106 process may conclude through the execution of a Memorandum of Agreement or Programmatic Agreement. Additionally, the BLM would retain the ability to modify or disapprove any activity with potential adverse effects that cannot be successfully avoided, minimized, or mitigated as provided for in the cultural resource stipulation attached to the lease.

BLM field offices must base site specific lease stipulations (such as CSU or NSO) and decisions to withdraw areas from leasing on decisions made within an RMP. RMPs are updated every 5 to 30 years and may not contain current information. If a decision maker determines a cultural resource is difficult or impossible to mitigate and wishes to apply lease stipulations or exclude the site from leasing, the RMP must be updated, amended, or a maintenance action performed prior to leasing.

1.6 Identification of Issues

Analysis required by NEPA was conducted by field office resource specialists who relied on site visits where access was available, personal knowledge of the areas involved, and/or review of existing databases and file information to determine if appropriate stipulations should be attached to specific parcels prior to being made available for lease.

The HPD is predominantly split estate (private surface and Federal minerals). Of the total 43 parcels nominated for leasing (a total of 22,895 Federal mineral acres and 2,391 Federal surface acres), 12 parcels include some Federal surface (2,391 Federal mineral acres), while the other 31 parcels are entirely Federal minerals underlying state or private surface (20,504 Federal mineral acres).

Field visits were performed on those parcels to which the BLM had access or access was allowed by the surface owners. Twenty-four (24) parcels were visited using public access such as county

or state roads. In the CFO, Parcels WY-1608-037, WY-1608-038, WY-1608-040, WY-1608-041 and WY-1608-042 were visited. In the NFO, Parcels WY-1608-002, WY-1608-005, WY-1608-007, WY-1608-008, WY-1608-009, WY-1608-011, WY-1608-012, WY-1608-013, WY-1608-014, WY-1608-020, WY-1608-021, WY-1608-022, WY-1608-023, WY-1608-026, WY-1608-030, WY-1608-031, WY-1608-032, WY-1608-034 and WY-1608-035 were visited. Pictures were taken at these 24 parcels and where available, GPS coordinates were taken at those photo points. Geographical information system (GIS) data and digital orthophoto quads were used regardless of whether or not the field teams could visit the parcels, but were predominantly relied on for review of the 17 parcels that were not visited.

Offering and issuing oil and gas leases is strictly an administrative action, which, in and of itself, does not cause or directly authorize any surface disturbance. After a lease has been issued, the lessee has the right to use as much of the leased lands as is necessary to explore, drill for, mine, extract, remove, and dispose of the oil and gas resources (see 43 CFR 3101.1-2, Surface use rights). These post-leasing actions can result in surface disturbance.

As part of the lease issuance process, nominated parcels are reviewed against the appropriate land use plans, and stipulations are attached to mitigate known environmental or resource conflicts that may occur on a given lease parcel. As stated above, on-the-ground impacts would potentially occur when a lessee applies for and receives approval to explore, occupy, and drill on the lease. The BLM cannot determine whether a parcel offered for sale will be leased, or if it is leased, whether the lease will be explored or developed, or how the parcel may be explored or developed. According to one estimate by the BLM Wyoming State Office Reservoir Management Group, from 1960 through 2011, 75,192 leases were issued in Wyoming. Of those, 4,920 leases produced some type of oil or gas in sufficient quantities that the lease was held by production. Therefore, 6.5 percent of the leases sold and 5.3 percent of the acreage was actually developed into production. Also, according to the Tenth Circuit Court of Appeals, site-specific NEPA analysis is not possible absent concrete proposals. Filing an APD is the initial point at which a site-specific environmental appraisal can be undertaken (Park County Resource Council, Inc. v. U.S. Department of Agriculture, 10th Cir., April 17, 1987). Before the lessee files a notice of staking (NOS), an APD, or a field development plan, the BLM cannot reasonably determine where companies propose to develop wells on a given lease or even if a lease will be developed at all. Accordingly, additional separate NEPA analysis will be required at the development stage to analyze project-specific impacts associated with exploration and development of the lease. That site-specific environmental documentation would address the site-specific analysis for each proposed well location. Additional conditions of approval (mitigation) may be applied at that time.

Interdisciplinary (ID) teams consisting of a multi-disciplinary group of resource specialists for each field office as well as the HPD were formed to review the parcels proposed for sale and subsequent leasing. ID Teams from each field office reviewed all resources within the given field office and determined whether the resource is present, present but not impacted, or present with the potential for impact. Those resources that were not present or not impacted were eliminated from further analysis as stated in section 1.7 below. Issues that were identified as present with the potential for impact and further discussed in this EA are air resources (including air quality, greenhouse gases (GHG) and visibility), heritage resources, lands and realty, socioeconomics,

special management areas, visual resource management (VRM), water resources and wildlife resources (including threatened and endangered (T&E) and BLM sensitive species). In some cases the RMP added stipulations for these resources and those stipulations are detailed in Chapter 4. Only those issues that were not addressed sufficiently in the tiered RMP EISs, where there is new information or BLM policy has changed are analyzed further in Chapter 4 of this EA. The specifics of that new information or BLM policy change is explained in Chapter 3 of this document.

TCPs, sacred sites, or other areas that are of concern to Native American tribes have the potential to be impacted by oil and gas development. The HPD took part in general discussions related to oil and gas leasing in November of 2010, May of 2011, June of 2011, February of 2012, May of 2012 and June of 2012 with representatives from the Cheyenne River Sioux, Rosebud Sioux, Crow Creek Sioux, Lower Brule Sioux, Oglala Sioux, Sisseton Wahpeton Oyate, Yankton Sioux, Flandreau Santee, Fort Peck, Three Affiliated, Crow, Northern Arapaho and Northern Cheyenne Tribes. The tribes suggested that the BLM consider their concerns with oil and gas leasing and any of their comments on this EA separately from comments received by the public and they voiced concern with the potential of the BLM revealing sensitive information in relation to sacred sites. The BLM must consider all comments on this EA regardless of the source, but the BLM is also required to make additional efforts to hear the concerns of tribes and to keep sensitive information confidential. Letters were sent to each tribe in an effort to gather any information that they are willing to share on this EA. The tribes also suggested the BLM address potential impacts to TCPs and sacred sites prior to issuance of oil and gas leases. The tribes contended that inventories performed by tribal surveyors are necessary to identify all resources that are important to tribes prior to leasing any parcel. They indicated that sites which archeologists interpret as stone circles or cairns may have spiritual significance that non-Native Americans cannot properly identify. The tribes pointed out that an NSO stipulation may not be an adequate site specific protection since they consider the subsurface minerals to be a part of that site. Native American burials were pointed out as especially sensitive sites that should be avoided by all surface disturbing activities. The tribes also argued that mitigation may be impossible for certain TCPs or sacred sites, and it is counterintuitive to lease oil and gas without prior knowledge of such sites.

However, the HPD has made a reasonable effort to identify known TCPs and sacred sites in consultation with the SHPO and tribes during the land use planning process and during the analysis for this document. Intensive field inventories covering entire lease parcels for this proposed lease sale are unnecessary to satisfy the BLM's Section 106 obligations. Additionally, the BLM's obligation to comply with the NHPA, the standard terms and conditions of the Federal lease (BLM Form 3100-11), and the limitation on surface use rights for oil and gas leases (43 CFR 3101.1-2) gives BLM decision makers the discretion to modify or deny any project specific proposals that could potentially disturb TCPs or sacred sites.

The BLM published final regulations on hydraulic fracturing on March 26, 2015 (80 FR 16128). These regulations became effective June 24, 2015[2]. The final rule seeks to address three key goals: (1) ensure that wells are properly constructed to protect water supplies; (2) make certain

[2] Implementation of the hydraulic fracturing regulations was temporarily stayed on June 23, 2015, by the United States District Court for the District of Wyoming. The Court preliminarily enjoined enforcing the rule by decision dated September 30, 2015.

that the fluids that flow back to the surface as a result of hydraulic fracturing operations are managed in an environmentally responsible way; and (3) provide public disclosure of the chemicals used in hydraulic fracturing fluids. Without a discrete development proposal, the use of hydraulic fracturing in the oil and gas development process cannot be predicted. However, this EA incorporates by reference, in its entirety, a Hydraulic Fracturing White Paper included in Appendix E. This document provides a general discussion of the hydraulic fracturing process and issues associated with its use.

1.7 Issues Considered but Eliminated from Further Analysis

The following issues were identified but eliminated from further analysis as described. The act of offering for sale these Federal mineral leases produces no direct, indirect, or cumulative impacts, except where noted above in Section 1.6 and in Chapter 4, to the following resources beyond those detailed within the respective field office RMP: environmental justice, farmlands, floodplains, fuels and fire management, invasive species and noxious weeds, access, livestock grazing and rangeland health, vegetation, wastes, wetlands and riparian zones, wild and scenic rivers, or woodland and forestry. The subsequent development of the lease would require an APD and/or sundry notice and, in some cases a right-of-way application to access and transport production to or from the lease, which would all require more site-specific review. Therefore, these resources will not be discussed further in this document.

The analysis of climate change is in its formative phase. It is not feasible to know with certainty the net impacts from the contribution of the proposed action on climate. The lack of precise and accurate 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. GHGs are analyzed in this document as it relates to the overall climate change analysis, but climate change alone will not be analyzed further in this document.

The proximity to existing and proposed renewable energy development, specifically wind development was considered by the BLM. Two split estate parcels in the CFO, WY-1608-040 and WY-1608-042, have 12 commercial wind turbines located on them. These parcels are located on the PacifiCorp and Duke Energy wind farms. Conflicts with private wind development were eliminated from further analysis due to the fact that the oil and gas lessee would be required to enter into good-faith negotiations in order to seek a surface access agreement with the surface owner. Thus, if any conflicts were to occur, they would be addressed by the lessee, the landowner and the surface managing agency in coordination with the BLM and the wind development company at the time of proposed exploration, development, and drilling.

The field offices screened each parcel for wilderness, wilderness study areas, and lands with wilderness characteristics. Screening criteria and the results are listed in Appendix B, field office screens, by respective field offices. The CFO and NFO found that all of their parcels do not meet the first criteria of the screen “more than 5,000 acres of roadless land (yes/no)”; and therefore do not qualify.

1.8 Public Participation

Upon receipt of the August 2016 competitive oil and gas lease sale parcel list, an informal notice letter was sent to affected split estate surface owners advising them of the nominations and to solicit their input concerning the lease sale. One call was received from a landowner requesting general information and clarification about the sale process. Another advised of a mailing address error and requested a better map. Informal letters were also sent to Native American tribal contacts known or identified as having interest or concerns with oil and gas leasing in the area. One email response indicated there may be tribal concerns in the area of some of the lease sale parcels, recognizing those concerns would be addressed at the time an APD or other development action is submitted. They also requested GIS data for the lease sale parcels. Another tribe indicated no concerns with any of the lease sale parcels. Notice letters were sent to the Forest Service, Douglas Ranger District and to units of the National Park Service in this regional area. The Superintendent of Devils Tower National Monument submitted a comment letter by email delineating several concerns with the parcels nominated for the August 2016 competitive oil and gas lease sale. These concerns reiterate comments submitted on the August 2015 oil and gas lease sale. Among the concerns are air quality, dark night skies, viewsheds, other important park resources, and cumulative impacts. Those comments and responses can be viewed on the BLM Competitive Lease Sale website. No new issues were identified that would suggest the need to consider alternatives beyond those being addressed in this EA.

A press release announcing the availability of the EA for comments was e-mailed to local media on January 19, 2016. The press release stated that the comment period for the EA would run until February 18, 2016. In addition, informational postcards were mailed to affected split estate landowners. Letters were mailed to Native American tribes, advising of the availability of the EA and the comment period. As required by BLM leasing policy, where parcels are split estate, a notification letter notifying them of the EA review and possibility to comment is sent to the surface owner based on the surface owner information provided by the party submitting the EOI.

1.9 Summary

This chapter presents the purpose and need for sale of those parcels within the HPD portion of the August 2016 Competitive Oil and Gas Lease Sale, as well as relevant issues. Those issues are elements of the human environment that could be affected by the administrative actions of offering and issuance of leases that were not previously addressed in the tiered RMP EISs, for which new BLM policy has changed or for which new information exists. In order to meet the purpose and need of the HPD portion of the August 2016 Competitive Oil and Gas Lease Sale in a way that resolves the issues, the BLM has considered a range of alternatives. These alternatives are presented in Chapter 2. Chapter 3 gives a description of the affected environment for each resource where a stipulation has been attached as dictated under the pertinent RMP. The potential environmental impacts or consequences to any resource affected resulting from implementation of each alternative considered in detail are analyzed in Chapter 4.

Chapter 2

Proposed Action and Alternatives

2.1 Introduction

The HPD received nominations for 43 parcels (22,895 Federal mineral acres and 2,391 Federal surface acres) for the August 2016 Competitive Oil and Gas Lease Sale. Out of those 43 parcels, 4 entire parcels and a portion of 1 parcel were deferred in Chapter 1 for the reasons described therein (see Appendix D, HPD Deferral Table). Therefore, the remaining 39 parcels will be analyzed in the remainder of this EA. Out of those remaining 39 parcels, 0 parcels are administered by the BFO, 6 parcels are administered by the CFO and 33 parcels are administered by the NFO. Federal mineral and Federal surface acres for parcels considered in Alternatives A and B are shown in Table 2.1 below.

Table 2.1 Parcels Offered for Alternatives A and B

Offered	Number Parcels	Federal Mineral Acres	Federal Surface Acres
Alternative A	0	0	0
Alternative B	39	22,495	2,271

In some cases, the field office recommended stipulations or deferrals that the HPD determined were not in conformance with previous leasing decisions or the pertinent RMP. Therefore, changes were made by the HPD in accordance with those determinations and are reflected throughout the rest of this document.

2.2 Common to All Alternatives

Lease stipulations will be applied to each parcel uniformly across all alternatives by field office to conform with each RMP (as amended). Please see Chapter 4, Common to All Alternative section for the details.

2.3 Alternative A – No Action

The BLM NEPA Handbook (H-1790-1) states that for EAs on externally initiated proposed actions, the No Action Alternative generally means that the proposed action would not take place. In the case of a lease sale, this would mean that an EOI to lease (parcel nomination) would be deleted. The No Action alternative would delete all 39 parcels from the HPD portion of the August 2016 Competitive Oil and Gas Lease Sale.

Any ongoing oil and gas development as well as any other land uses would continue on surrounding Federal, private, and state leases.

Selection of the No Action Alternative would not preclude the re-nomination of a deleted parcel from future sale as long as the area remains open to fluid mineral leasing.

2.4 Alternative B – Proposed Action

Alternative B would offer all 39 parcels currently analyzed in this EA for the HPD portion of the August 2016 Competitive Oil and Gas Lease Sale (Table 2.2). Under Alternative B, 22,495 Federal mineral acres and 2,271 Federal surface acres would be offered for lease, while 400 Federal mineral acres and 120 Federal surface acres would be deferred.

Table 2.2 Federal Acres Offered and Deferred in Alternative B

Alternative B	Number Parcels	Federal Mineral Acres	Federal Surface Acres
Offered	39	22,495	2,271
Deferred	5	400	120

2.5 Alternatives Considered, but Eliminated from Further Analysis

No other action alternatives were considered by the three field office ID teams or the HPD.

Chapter 3

Affected Environment

3.1 Introduction

This Chapter presents the affected environment (*i.e.*, the physical, biological, social, and economic values and resources) identified by the three field offices, and presented as issues in Chapter 1 (Section 1.6) of this EA. This Chapter provides the baseline for comparison of alternatives for impacts and consequences described in Chapter 4. Refer to Appendix A, Affected Environment Tables which provides a HPD summary of stipulations applied by parcel.

3.2 General Setting

The HPD encompasses lands in Campbell, Converse, Crook, Goshen, Johnson, Natrona, Niobrara, Platte, Sheridan and Weston Counties in Wyoming. The area is characterized by somewhat flat rolling prairie with breaks and steep gullies near major hydrologic features. The proposed lease sale parcels are located in Converse, Crook, Niobrara and Weston Counties.

3.3 Resources/Issues Identified for Analysis

3.3.1 Air Resources

In addition to the air quality information in the RMPs, new information about GHGs and their effects on national and global climate conditions has emerged. On-going scientific research has identified the potential impacts of GHG emissions such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and several trace gases on global climate. Through complex interactions on a global scale, GHG emissions cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and burning of fossil carbon sources have caused GHG concentrations to increase measurably, and may contribute to overall climatic changes.

This EA incorporates an analysis of the contributions of the proposed action to GHG emissions and a general discussion of potential impacts to climate. Air Resources include climate, climate change, air quality, air quality-related values (including visibility and atmospheric deposition) and smoke management. Therefore, NEPA requires that the BLM must consider and analyze the potential effects of BLM and BLM-authorized activities on air resources as part of the planning and decision-making process.

3.3.1.1 Air Quality

The U.S. Environmental Protection Agency (EPA) establishes air quality standards (NAAQS) for criteria pollutants. Criteria pollutants include carbon monoxide (CO), nitrogen dioxide

(NO_2), ozone (O_3), particulate matter 2.5 microns or less in diameter (PM2.5), particulate matter 10 microns or less in diameter (PM10), sulfur dioxide (SO_2) and lead (Pb). Air pollutant concentrations greater than the NAAQS would represent a risk to human health.

The EPA has delegated regulation of air quality to the State of Wyoming and is administered by the Wyoming Department of Environmental Quality (WDEQ). Wyoming Ambient Air Quality Standards (WAAQS) and NAAQS identify maximum limits for concentrations of criteria air pollutants at all locations to which the public has access. The WAAQS and NAAQS are legally enforceable standards. Concentrations above the WAAQS and NAAQS represent a risk to human health that, by law, require public safeguards be implemented. State standards must be at least as protective of human health as Federal standards, and may be more restrictive than Federal standards, as allowed by the Clean Air Act.

For the most part, the counties that lie within the jurisdictional boundaries of the HPD (Natrona, Converse, Platte, Goshen, Niobrara, Weston, Crook, Campbell, Sheridan, and Johnson) are classified as in attainment for all state and national ambient air quality standards as defined in the Clean Air Act. The one exception is the City of Sheridan, which was designated as nonattainment for PM10 in 1991 (56 FR 11101). All monitoring sites operated by the WDEQ Air Quality Division (AQD) and the BLM in the HPD, including the City of Sheridan, are currently in compliance with the NAAQS and WAAQS.

Various state and Federal agencies monitor air pollutant concentrations and visibility throughout Wyoming. Table 3.1 lists the available air quality monitoring sites within the HPD and relevant sites nearby. The WDEQ operates PM10 monitors as part of the State and Local Monitoring Site (SLAMS) network. Other sites include several Interagency Monitoring of Protected Visual Environments (IMPROVE) monitors and BLM administered sites that are part of the Wyoming Air Resource Monitoring System (WARMS). Atmospheric deposition (wet) measurements of ammonium, sulfate, and various metals are taken at the Newcastle Site, which the BLM operates as part of the National Acid Deposition Program (NADP).

Table 3.1 Air Quality Monitoring Sites within the HPD

County	Site Name	Type of Monitor Type	Parameter	Operating Schedule	Location	
					Longitude	Latitude
Campbell	Thunder Basin	SPM	O3, NOx and Met	Hourly	-105.3000	44.6720
	South Campbell County	SPM	O3, NOx, PM10 and Met	1/3 (PM10) and hourly (NOx and O3)	-105.5000	44.1470
	Belle Ayr Mine	SPM	NOx and PM2.5	1/3 (PM2.5) and hourly (Ox)	-105.3000	44.0990
	Wright	SPM	PM10	1/6	-105.5000	43.7580
	Gillette	SLAMS	PM10	1/6	-105.5000	44.2880
	Black Thunder Mine	SPM	PM2.5	1/3	-105.2000	43.6770
	Buckskin Mine	SPM	PM2.5	1/3	-105.6000	44.4720

County	Site Name	Type of Monitor Type	Parameter	Operating Schedule	Location	
					Longitude	Latitude
	Fortification Creek	WARMS	PM2.5,Nitrate,Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide, Meteorology	1/3 (PM2.5) and 1/7 (others)	-105.9198	44.33953
	South Coal	WARMS	PM2.5 and Meteorology		-105.8378	44.9401
	Thunder Basin	IMPROVE	PM2.5, Nitrate, Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide & Meteorology	1/3	-105.2874	44.6634
Converse	Antelope Mine	SPM	PM2.5	1/3 (PM2.5) and hourly (NOx)	-105.4000	43.4270
Johnson	Buffalo	WARMS	PM2.5, Nitrate, Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide and Meteorology	1/3 (PM2.5) and 1/7 (others)	-106.0189	44.1442
	Cloud Peak	IMPROVE	PM2.5, Nitrate, Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide and Meteorology	1/3	-106.9565	44.3335
Natrona	Casper	SLAMS	PM10 and PM 2.5	1/3	-106.3256	42.8516
Sheridan	Sheridan-Highland Park	SLAMS	PM10 and PM2.5	1/3 (PM10); 1/3 and 1/6 (PM2.5)	-107.0000	44.8060
	Sheridan-Police Station	SLAMS	PM10 and PM2.5	1/1 (PM10) and 1/3 & 1/6 (PM2.5)	-107.0000	44.8330
	Sheridan	WARMS	PM2.5, Ozone, Nitrate, Ammonium, Nitric Acid, Sulfate and Sulfur Dioxide,	1/3 (PM2.5) and 1/7 (others)	-106.8472	44.9336
Weston	Newcastle	WARMS	PM2.5, Nitrate, Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide and Meteorology, ozone	1/3 (PM2.5) and 1/7 (others)	-104.1919	43.8731
	Newcastle	NADP	Wet deposition of ammonium, sulfate, metals	Weekly	-104.1917	43.873

The BLM assessed recent air quality conditions within the HPD boundary by examining data collected by monitors in the area, supplemented by various monitors in neighboring planning areas, as summarized in Table 3.2. The examination of these data indicates that the current air quality for criteria pollutants in the HPD is in compliance with applicable NAAQS and WAAQS. Based on measurements in the area, visibility in the HPD is considered very good.

Table 3.2 Primary Standards and Representative Concentrations (Air Quality Conditions)

Pollutant	Averaging Time	NAAQS (WAAQS if different)	Representative Concentrations	Data Source
Carbon Monoxide (CO)	1 hour	35 ppm	0.4 ppm	**Cheyenne NCore Air Quality Monitoring Station.** 2014 Design Value. Data source: http://www3.epa.gov/airtrends/values.html
	8 hour	9 ppm	0.3 ppm	
Nitrogen Dioxide (NO_2)	1 hour	100 ppb	35 ppb	**Belle Ayr BA-4 Air Quality Monitoring Station**, Campbell County. 2014 Design Value. http://www3.epa.gov/airtrends/values.html

Pollutant	Averaging Time	NAAQS (WAAQS if different)	Representative Concentrations	Data Source
	Annual	53 ppb	3 ppb	**South Campbell County Monitoring Site**. 2014 Design Value. Data source: http://www3.epa.gov/airtrends/values.html
Ozone	8 hour	0.070 ppm	0.063 ppm	**Thunder Basin National Grasslands Monitoring Site.** 2012-2014 Design Value. Data source: http://www3.epa.gov/airtrends/values.html
PM_{10}	24 hour	150 µg/m3	52 µg/m^3	2014 max PM10 concentration at the Campbell County Monitoring Site. Data Source: http://wyvisnet.com/Data/Reports.aspx
	Annual	(50 µg/m3)	12 µg/m^3	2014 Annual Mean for the **Campbell County** Monitoring Site. Data Source: http://wyvisnet.com/Data/Reports.aspx
$PM_{2.5}$	24 Hour	35 µg/m3	15 µg/m^3	**Casper SLAMS Site.** 2012-2014 Design Value. Data Source: http://www3.epa.gov/airtrends/values.html
	Annual	12.0 µg/m3	4.8 µg/m^3	**Casper SLAMS Site**. 2012-2014 Design Value. Data Source: http://www3.epa.gov/airtrends/values.html
Sulfur Dioxide (SO_2)	1 hour	75 ppb	33 ppb	**Sinclair** Monitoring Station, Casper.2012-2014 Design Value. Data source: http://www3.epa.gov/airtrends/values.html

3.3.1.2 Greenhouse Gas Emissions

GHGs that are included in the U.S. Greenhouse Gas Inventory are: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC) and sulfur hexafluoride (SF_6). CO_2 and methane (CH_4) are typically emitted from combustion activities or are directly emitted into the atmosphere.

Some GHGs such as carbon dioxide occur naturally and are emitted to the atmosphere through both natural processes and human activities. Other GHGs (e.g., fluorinated gases) are created and emitted solely through human activities. The primary GHGs that enter the atmosphere as a result of anthropogenic activities include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_20), and fluorinated gases such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. These synthetic gases are GHGs that are emitted from a variety of industrial processes.

The status of GHGs as a pollutant is not related to toxicity, but to the long-term impacts they may have on climate due to increased levels in the earth's atmosphere. Because they are non-toxic and non-hazardous at normal ambient concentrations, GHGs do not have applicable ambient standards or emission limits under the major environmental regulatory programs described above.

On October 30, 2009, the EPA issued the reporting rule for major sources of GHG emissions (40 CFR Part 98). The rule requires a wide range of sources and source groups to record and report selected GHG emissions. Various oil and gas operations are required to monitor and report GHG

emissions under this regulation. On June 3, 2010, the EPA issued the Prevention of Significant Deterioration (PSD) and Title V Greenhouse Gas Tailoring Rule. The rule provides criteria to determine which stationary sources become subject to permitting requirements for GHG emissions under the PSD and Title V programs of the Clean Air Act. The rule is based on calculation of carbon dioxide equivalents (CO_2e), which factors in the global warming potential of each GHG and normalizes this to an equivalent of CO_2 emissions. The rule applies to major source facilities that require a PSD or Title V air quality permit for other criteria pollutants and have CO_2e emissions in excess of 100,000 tpy.

Several activities occur within the HPD that may generate GHG emissions: oil, gas, and coal development, large fires, livestock grazing, and recreation using combustion engines which can potentially generate CO_2 and methane. Oil and gas development activities can generate carbon dioxide (CO_2) and methane (CH_4). CO_2 emissions result from the use of combustion engines, while methane can be released during processing. Wildland fires also are a source of other GHG emissions, while livestock grazing is a source of methane. A description of the potential GHG emissions associated with the proposed leasing activities is included in Chapter 4.

Of the parcels that have been nominated for the HPD portion of the August 2016 Competitive Oil and Gas Lease Sale, all are located within areas defined as having high, moderate, low, or very low potential for occurrence of oil and gas (see RMP Reasonably Foreseeable Development scenarios (RFD) for Casper (page 49, Table 15), Buffalo (page 429, Appendix J, Reasonable Foreseeable Actions), and Newcastle (page 245 and map I-1).

3.3.1.3 Visibility

There are several National Parks, National Forests, recreation areas, and wilderness areas within and surrounding the HPD. Table 3.3 lists areas designated as Class I or Class II Areas. National Parks, National Monuments, and some state designated Wilderness Areas are designated as Class I. The Clean Air Act "declares as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas…from manmade air pollution." 42 U.S.C. 7491(a)(1). Under BLM Manual Section 8560.36, BLM-administered lands, including wilderness areas not designated as Class I, are managed as Class II, which provides that moderate deterioration of air quality associated with industrial and population growth may occur.

Table 3.3 National Parks, Wilderness Areas, and National Monuments

Area Name	Closest Distance to High Plains District (miles)	Direction from the High Plains District	Clean Air Act Status of the Area
Badlands National Park	>100	East	Class I
Bridger Wilderness Area	90	West	Class I
Cloud Peak Wilderness Area	within	---	Class II
Devils Tower National Monument	within	---	Class II
Fitzpatrick Wilderness Area	100	West	Class I
Grand Teton National Park	>100	West	Class I

Area Name	Closest Distance to High Plains District (miles)	Direction from the High Plains District	Clean Air Act Status of the Area
Jewel Cave National Monument	<20	East	Class II
North Absaroka Wilderness Area	>100	Northwest	Class I
Teton Wilderness Area	>100	Northwest	Class I
Washakie Wilderness Area	>100	Northwest	Class I
Wind Cave National Park	<50	East	Class I
Yellowstone National Park	>100	Northwest	Class I

Source: NPS 2006

Regional haze is visibility impairment caused by the cumulative air pollutant emissions from numerous sources over a wide geographic area. Visibility impairment is caused by particles and gases in the atmosphere that scatter, distort, or absorb light. The primary cause of regional haze in many parts of the country is light scattering resulting from fine particles (i.e., PM2.5) in the atmosphere. Additionally, coarse particles between 2.5 and 10 microns in diameter can contribute to light extinction. Coarse particles and PM2.5 can be naturally occurring or the result of human activity. The natural levels of these species result in some level of visibility impairment, in the absence of any human influences and will vary with season, daily meteorology, and geography (Malm 1999).

The EPA and other Federal land managers monitor visibility in national parks and wilderness areas. Observations over time have shown that visibility is not as good as it could be compared to natural background conditions (i.e., visibility is impaired relative to natural background conditions). In 1999, the EPA issued a Regional Haze Rule to protect visibility in over 150 national parks and wilderness areas. The Regional Haze Rule requires states to establish Reasonable Progress Goals for improving visibility, with the overall goal of attaining natural background visibility conditions by 2064.

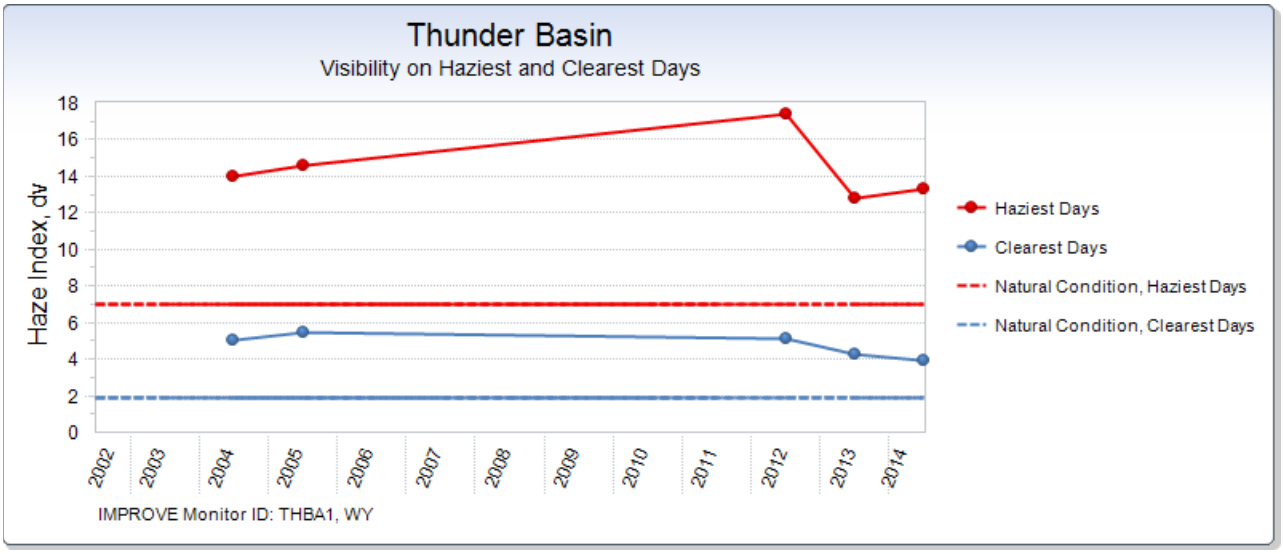
Visibility impacts are expressed in deciviews (dv), which is a measure for describing perceived changes in visibility. Deciview values are calculated from either measured or estimated light extinction values in units of inverse megameters (Mm-1). A dv value of zero indicates a pristine atmosphere.

Visibility from monitoring sites operated by the IMPROVE program are shown in Figures 3.1-3.3 for three of the nearest IMPROVE sites over the period from 2002 to 2014. Thunder Basin National Grassland does not have data for 2003 and from 2006 through 2011. Federal land managers have estimated natural background visibility conditions for Wind Cave National Park, which is a federally designated Class I area. Natural background visibility conditions are not available for Thunder Basin National Grassland and Cloud Peak Wilderness Area because they are not federally protected Class I areas. For Wind Cave National Park, the estimated natural background visibility conditions for the 20 percent best and 20 percent worst days are 2.1 dv and 7.2 dv, respectively.

The figures show the most recent 20 percent best days at the IMPROVE sites generally have visibility values less than 6 dv, while the 20 percent worst days typically have visibility values

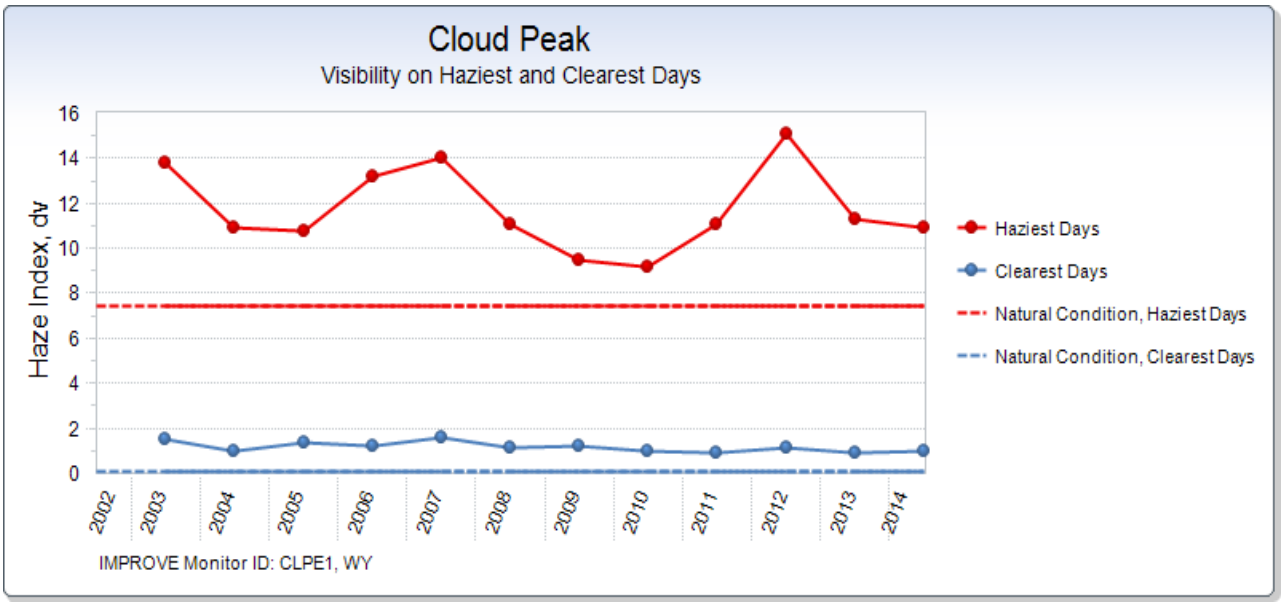
greater than 8 dv. When comparing the current visibility at Wind Cave National Park to the estimated natural background conditions, both the 20 percent worst and 20 percent best days are higher than natural background conditions.

Figure 3.1 Visibility Index for the Thunder Basin IMPROVE site



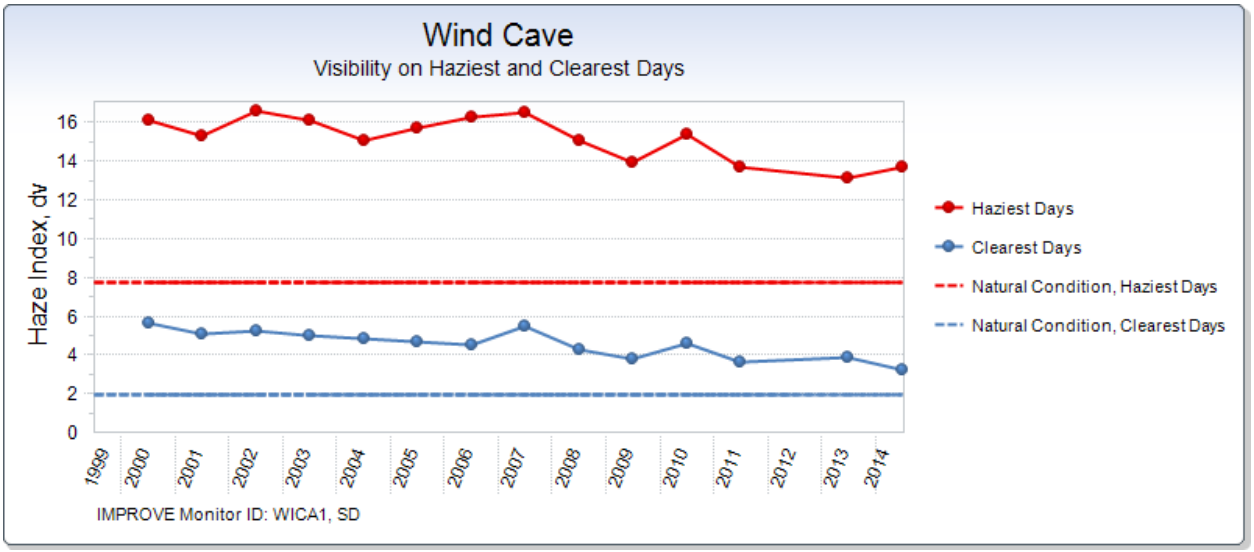
Source: Federal Land Manager Environmental Database (http://views.cira.colostate.edu/fed/AqrvMenu.aspx)

Figure 3.2 Visibility Index for the Cloud Peak IMPROVE site



Source: Federal Land Manager Environmental Database (http://views.cira.colostate.edu/fed/AqrvMenu.aspx)

Figure 3.3 Visibility Index for Wind Cave IMPROVE site



Source: Federal Land Manager Environmental Database (http://views.cira.colostate.edu/fed/AqrvMenu.aspx)

3.3.1.4 Deposition

Atmospheric deposition refers to the processes by which air pollutants are removed from the atmosphere and deposited on terrestrial and aquatic ecosystems, and it is reported as the mass of material deposited on an area per year (kg/ha/yr). Air pollutants are deposited by wet deposition (precipitation) and dry deposition (gravitational settling of pollutants). The chemical components of wet deposition include sulfate (SO_4), nitrate, and ammonium; the chemical components of dry deposition include sulfate, sulfur dioxide, nitrate, ammonium, and nitric acid.

The NADP and the National Trends Network (NTN) station monitors wet atmospheric deposition and the CASTNET station monitors dry atmospheric deposition. The effects of atmospheric deposition of nitrogen and sulfur compounds on terrestrial and aquatic ecosystems are well documented and have been shown to cause leaching of nutrients from soils, acidification of surface waters, injury to high elevation vegetation, and changes in nutrient cycling and species composition. High elevation aquatic ecosystems in the west, including those in Wyoming, are often sensitive to acidification, to which both nitrogen and sulfur deposition contribute. Background total nitrogen and sulfur deposition data are collected at the NADP National Trends Network (wet deposition) and CASTNet (dry deposition) monitoring locations near Wind Cave National Park in South Dakota and Newcastle, Wyoming. The most recent available background nitrogen and sulfur deposition data for monitoring year 2013 are shown in Table 3.4.

Table 3.4 Background Nitrogen and Sulfur Deposition Values for 2013

Site Location	Nitrogen Deposition (kilograms/hectare/year)		Sulfur Deposition (kilograms/hectare/year)	
	Wet[1]	Dry[2]	Wet[1]	Dry[2]
Wind Cave National Park, SD	5.53	0.906	2.84	0.195

Newcastle, WY	4.31	-	2.41	-

[1] NADP 2015a, 2015b.
[2] EPA 2015b.

To assess atmospheric deposition impacts to sensitive waterbodies, the change in the acid neutralizing capacity (ANC) of sensitive lakes is evaluated. The most current ANC values available for lakes in the Cloud Peak Wilderness area and the number of samples used in the calculation of the lowest 10th percentile ANC values are provided in Table 3.5**.**

Table 3.5 Background ANC Values for Acid Sensitive Lakes

Wilderness Area	Lake	Latitude (Deg-Min-Sec)	Longitude (Deg-Min-Sec)	10th Percentile Lowest ANC Value Reported (µeq/l)	Number of Samples
Cloud Peak	Florence Lake	44º20'53"	107º10'50"	**70**	**40**
Cloud Peak	Emerald Lake	44º27'26"	107º18'11"	**34.4**	**42**

Source: USFS 2011

There is substantial peer-reviewed evidence that suggests nitrogen deposition is a significant concern for high alpine ecosystems. A risk assessment evaluating the sensitivity of NPS areas to nutrient enrichment effects from nitrogen deposition ranked these ecosystems as highly sensitive to nitrogen impacts. Further, Pardo et al. (2011) synthesized, evaluated, and extrapolated nitrogen critical loads values for ecoregions across the United States and concluded that the cumulative critical load necessary to protect shrublands and lichen communities is 3 kg/ha/year total deposition. As deposition approaches and/or exceeds the critical load, these ecosystems are at risk of changes in plant communities, including loss of native species, invasions of unwanted species like cheatgrass, changes in nutrient cycling, loss of biodiversity, and other negative effects.

3.3.2 Heritage Resources

All parcels addressed in this EA have the potential to contain historic properties including prehistoric and historic archaeological sites, TCPs, and sacred sites. File searches performed by individual field offices revealed that portions of the parcels have been previously inventoried for cultural resources, but there are many areas that have not been inventoried. Prior inventories in or near the parcels located site types that include prehistoric habitations, lithic scatters, stone circle sites, cairns, prehistoric quarries and workshops, prehistoric rock art, historic trash scatters, trash scatters, homesteading sites, historic trails, and historic inscriptions. The majority of the sites are not eligible, although numerous historic properties are present. Reviews of individual RMPs revealed that protective stipulations were applied to historic properties within proposed lease sale parcels as described below.

Historic Trails

Four National Historic Trails (NHT) and other historic trails of regional and national significance cross the CFO and the HPD. The four NHTs are formally known as the "Oregon-California-Mormon Pioneer-Pony Express Trail," but generically as the Oregon Trail because the routes

overlap in many areas. The NHTs are associated with sites such as Fort Caspar and Fort Laramie. These routes were major thoroughfares for westward expansion, military campaigns, and to the gold fields of California, Idaho, and Montana. John Bozeman's shorter route to the Montana mining area was one of the catalysts of the Plains Indian wars in the latter half of the nineteenth century. Additionally, the Texas Trail, the Cheyenne-Deadwood Stage Road, and other historic roads were routes important at a regional level, opening central Wyoming to settlement, commerce, agriculture, industry, and travel. Congress designated the Oregon and Mormon Pioneer trails as NHTs in November 1978. The purpose of that Act was to identify and protect the trails, along with their historic remnants and artifacts, for public use and enjoyment.

In 1863 John Bozeman scouted a route through the Powder River Basin that would provide a direct overland route for freight traffic and immigrants to the gold fields in western Montana. The later establishment of the Bozeman Trail and the efforts of the United States Army to protect travelers along the route led to "Red Cloud's War" between the United States Army and a combined force of Sioux, Cheyenne, and Arapaho. Although the U.S. Army established several forts along the Bozeman Trail, it never fully succeeded in protecting travelers along the trail. The Fetterman Battle near Fort Phil Kearney resulted in the worst defeat of the U.S. Army at the hands of the Plains Indians as Fetterman and his entire command of 80 soldiers were killed. The Army eventually abandoned its occupation of the region with the signing of the second Treaty of Fort Laramie in 1868, which closed the Bozeman trail and ceded the area to the Sioux.

Along the Texas Trail passed the greatest migration of men and cattle from Texas to replace the fast vanishing buffalo in Wyoming and Montana. Used from 1876 to 1897, the trail entered Wyoming where the town of Pine Bluffs now sits. It extended north through eastern Wyoming on a line parallel to today's US 85, connecting to the current I-90 corridor at Moorcroft, then up the Little Powder River into Montana. Much of the trail paralleled the Cheyenne-Deadwood Stage Route.

Parcel WY-1608-014 in the NFO contains segments of the Cheyenne-Deadwood Trail.

Parcel WY-1608-038 in the CFO contains segments of the Bozeman Trail.

3.3.3 Lands and Realty

The BLM Lands and Realty program is aimed at managing the underlying land base that hosts and supports all resources and management programs. Key activities of field office lands and realty programs include (1) land use authorizations (e.g., rights-of-way, leases and permits, airport leases); (2) land tenure adjustments (e.g., sales, exchanges, donations, purchases); and (3) withdrawals, classifications and other segregations. The BLM works cooperatively to manage the lands and realty program with other Federal agencies, the State of Wyoming, counties and cities, and other public and private landholders.

Wyoming has issued policy (IM WY-2015-054) to address setbacks from occupied structures that will be implemented at the development stage.

3.3.4. Paleontology

Fossils generally are considered to be scientifically noteworthy if they are unique, unusual, rare, diagnostically or stratigraphically important, or add to the existing body of knowledge in a specific area of science. Most paleontological resources occur in sedimentary rock formations. Although experienced paleontologists generally can predict which formations may contain fossils and what types of fossils may be found based on the age of the formation and its depositional environment, predicting the exact location where fossils may be found is not possible. The BLM utilizes the Potential Fossil Yield Classification (PFYC) system to classify the potential to discover or impact important paleontological resources. The PFYC is based on the likelihood of geologic formations to contain important paleontological resources using a scale of 1 (very low potential) to 5 (very high potential). The PFYC is intended to help determine management and mitigation approaches for leasing and surface-disturbing activities. The potential for mitigation efforts is typically aimed at higher-potential formations (class 4 and 5).

The Upper Cretaceous Lance Formation (PFYC Class 5) can contain a diverse extinct fauna including tyrannosaurs and other theropods, ankylosaurs, hadrosaurs and other ornithopods, ceratopsians, and pachycephalosaurs, and pterosaurs, as well as a variety of mammals, reptiles, amphibians, birds, and fish. Portions of the formation are exposed within each of the three field offices and there have been numerous significant finds within the NFO.

Two parcels in the NFO, WY-1608-018 and WY-1608-019, occur within the Lance Creek Formation.

3.3.5 Recreation and Special Management Areas

Recreational use of the available parcels and the surrounding areas is typically for hunting, fishing, camping, sightseeing, driving for pleasure, off-highway vehicle use, and other recreational activities. In the national survey of fishing, hunting and wildlife-associated recreation for activities in 2006, expenditures from fishing and hunting significantly increased. In Wyoming, more than 320,000 people participated in fishing and hunting in 2006. Additionally, 716,000 people participated in some form of wildlife watching (USFWS 2006 National Survey of Fishing, Hunting, and Wildlife Associated Recreation). The total number of hunting and fishing recreation use days in Wyoming in 2008 was 3,683,371. Based on the number of recreation days and average expenditure per day, hunters, anglers, and trappers expended approximately $685 million in pursuit of their sport (WGFD Annual Report 2008). Non-consumptive users provided about $420 million through wildlife watching, wildlife photography, etc. In total, wildlife associated recreation accounted for over $1 billion dollars in income to the state for the year 2008 (WGFD Annual Report 2008).

Special Management Areas elevate resources and associated uses and opportunities to a high priority to meet the objectives to maintain and enhance those specific resources. In accordance with the BLM's *Land Use Planning Handbook*, the BLM has identified Special Recreation Management Areas (SRMA) to manage important recreational resources in the planning area. The primary objective of establishing SRMAs under recreation management zone guidance is to

direct recreation program priorities toward areas with high resource values, elevated public concern, or large amounts of recreational activity.

3.3.6 Socioeconomic Resources

In addition to the social and economic assessments and impact analyses located in the earlier referenced RMPs, this section will provide some updated data for the counties in the HPD. As mentioned previously the social and economic analysis area (analysis area) includes the following counties: Campbell, Converse, Crook, Goshen, Johnson, Natrona, Niobrara, Platte, Sheridan and Weston Counties. The below information provides a brief local context for this oil and gas lease sale EA. Please refer to the referenced RMPs for additional discussion on social and economic aspects of these counties.

The culture and community identities across the analysis area have been influenced by the opportunities that local natural resources provide for, especially for agricultural, energy development, and recreational opportunities. Across the analysis area, 99 to 100 percent of the land area is categorized as rural; however, a majority of the population is categorized as urban for Campbell, Goshen, Natrona and Sheridan Counties (Table 1) (U.S. Census, 2010a). In Natrona County the urban population is located in an urbanized area[3] whereas for the urban populations in the other counties, the urban population is scattered across urban clusters[4]. Crook and Niobrara Counties have 100 percent of their populations categorized as rural[5], while there is a majority of the population categorized as rural for Converse, Platte and Weston Counties. Excepting Platte County, all of the counties of the analysis area have seen an increase in population from 2000 to 2010, with the largest increase occurring in Campbell County and the smallest increase occurring in Niobrara County. Platte County realized a small decrease in population over this same time period (Table 2) (U.S. Census, 2010b).

Table 3.4 Urban and Rural Population and Area

County	Population		Area (square meters)	
	Percent Urban	Percent Rural	Percent Urban	Percent Rural
Campbell County	70.9%	29.1%	0.5%	99.5%
Converse County	44.6%	55.7%	0.1%	99.9%
Crook County	0.0%	100.0%	0.0%	100.0%
Goshen County	54.0%	46%	0.2%	99.9%
Johnson County	50.9%	49.1%	0.1%	99.9%
Natrona County	85.6%	14.5%	0.6%	99.4%
Niobrara County	0.0%	100.0%	0.0%	100.0%
Platte County	41.4%	58.7%	0.1%	99.9%
Sheridan County	64.5%	35.5%	0.5%	99.5%
Weston County	45.5%	54.6%	0.1%	99.9%

[1]U.S. Census 2010a

[3] Urbanized areas refer to areas of 50,000 or more people (U.S. Census 2012a).

[4] Urban clusters are areas of at least 2,500 people and less than 50,000 people (U.S. Census 2012a).

[5] All other population, housing, and areas are not included.

Table 3.5 Analysis Area Counties Population and Median Age

	2000 Census		2010 Census		
	Total Population	Median Age	Total Population	Median Age	% Change in Population 2000 to 2010
Campbell County	33,698	32.2	46,133	31.9	36.9%
Converse County	12,052	37.5	13,833	39.0	14.8%
Crook County	5,887	40.2	7,083	43.6	20.3%
Goshen County	12,538	40.0	13,249	43.6	5.7%
Johnson County	7.075	43.0	8,569	44.8	21.1%
Natrona County	66,533	36.4	75,450	36.8	13.4%
Niobrara County	2,407	42.8	2,484	46.1	3.2%
Platte County	8,807	41.2	8,667	47.5	-1.6%
Sheridan County	26,560	40.6	29,116	41.9	9.6%
Weston County	6,644	40.7	7,208	42.3	8.5%
Total Analysis Area	127,221	na	152,191	na	19.6%

[1]U.S. Census 2010b

The HPD provides productive rangelands for grazing thus contributing to the agricultural industry in the area. Additionally, agricultural opportunities are reflected by statistics on the acreage of land in farms and value of agricultural products sold. Across the analysis area there are 4,600 farms, 34,603,832acres of land in farms and $546,370,000 in the market value of agricultural products sold (Table 3) (NASS, 2007). Goshen and Platte Counties rank at or near the top in the market value of agricultural products sold, at 1st and 3rd, respectively. Crook, Campbell and Sheridan Counties rank high in the market value of agricultural products sold, at 9th 10th and 11th respectively. This information helps convey the importance of agriculture to the analysis area and to the State of Wyoming as a whole.

Table 3.6 Analysis Area Agricultural Statistics

	Land in Farms (acres)	# of Farms	Market Value of Agricultural Products Sold	State Rank of Total Value of Agricultural Products Sold
Campbell County	2,345,915	633	$40,140,000	10
Converse County	2,366,020	435	$34,753,000	15
Crook County	1,569,912	457	$43,983,000	9
Goshen County	1,368,342	815	$157,512,000	1
Johnson County	1,946,1997	319	$27,987,000	18
Natrona County	2,181,451	403	$32,704,000	16
Niobrara County	1,449,111	235	$37,057,000	12
Platte County	1,308,165	487	$97,071,000	3
Sheridan County	1,224,625	599	$48,662,000	11
Weston County	1,328,294	237	$26,501,000	20
Total Analysis Area	34,603,832	4,620	$546,370,000	na

[1]NASS, 2007

Energy development is also important to the analysis area. In 2011 the HPD produced 37 percent of the total amount of oil produced in Wyoming and 7 percent of the gas (WOGCC, 2012).

Furthermore, the mining sector[6] accounted for 25 percent of the private non-farm employment[7] in 2011 (BEA, 2012a). The revenue generated from oil and gas production as well as the associated employment contributes to the local economies. In addition to revenues from oil and gas production, the sale of oil and gas leases also provides revenue for local economies. The money from the sales of leases goes to the Office of Natural Resources Revenue which manages all revenue from mineral onshore and offshore leases. The Federal government retains a percentage of the revenues and the remainder is disbursed back to the state in which the leases were sold. Each state determines the amount to retain and how much to disburse to the counties in which the leases were sold. This data is retained by the Office of Natural Resources Revenue and the Wyoming Department of Revenue and has been requested; however, we have not yet received this data.

3.3.7 Water Resources

Surface water

Surface water hydrology within the area is typically determined by geology, soil characteristics, precipitation, and water erosion. Factors that affect surface water resources include livestock grazing management, private, commercial and industrial development, recreational use, drought, and vegetation control treatments.

Groundwater

The groundwater resources in the lease sale area are dependent upon the geologic outcrops that are present in each watershed. The groundwater resources and their protection are administered by the WDEQ under authority from the EPA. In addition to other agencies requirements, ground water protection restrictions would be applied according to the most recent applicable BLM RMP for each field office. Common aquifers encountered in the district include shallow unconfined surficial aquifers, which regionally are those that are the most susceptible to surface contamination. These aquifers are generally located within alluvial deposits along the major tributaries and rivers in each watershed. Other confined aquifers that are encountered are from various sandstone and limestone formations of the Tertiary, Cretaceous, and Paleozoic periods. All fresh water zones that are encountered during drilling are isolated for protection and reported to the BLM. Information contained in Appendix E, Hydraulic Fracturing White Paper, Section II, Operational Issues/Water Availability and Consumption (page 4 and Attachment 1), is incorporated by reference.

There are no parcels in the August 2016 Lease Sale that have Class I or II water resources.

[6] The mining sector as defined for the North American Industry Classification System (NAICS) comprises "establishments that extract naturally occurring mineral solids, such as coal and ores; liquid minerals, such as crude petroleum; and gases, such as natural gas" (U.S. Census, 2012c).

[7] Private non-farm employment is wage and salary employment excluding farm employment and government employment (BEA, 2012b).

3.3.8 Visual Resources Management (VRM)

The BLM VRM Class objectives are as follows:

> Class I: to preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention.
>
> Class II: to retain the existing landscape character and the level of change to the characteristic landscape should be low. Management activities should not attract the attention of the casual observer. Changes would be required to repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. Modification to a proposal would be required if the proposed changes cannot be adequately mitigated to retain the character of the landscape.
>
> Class III: to partially retain existing landscape character. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate a casual observer's view. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
>
> Class IV: to provide the management activities which require major modification of the existing landscape character. Every attempt, however, should be made to reduce or eliminate activity impacts through careful location, minimal disturbance, and repeating the basic landscape elements.

VRM Classifications only apply to BLM-administered surface estate, and therefore do not apply to non-BLM surface within the VRM classification areas. No parcels in the August 2016 Competitive Oil and Gas Lease Sale are managed under VRM Class I or Class II objectives. All parcels nominated in the August 2016 Competitive Oil and Gas Lease Sale are located in Class III or IV, with the majority in VRM Class IV. The scenic quality rating units contain different landscapes exhibiting high and low degrees of natural elements of form, line, color and texture. All rating units contain landscape modifications that impair the natural scenic quality.

3.3.9 Wildlife and Special Status Species (Plants and Animals)

3.3.9.1 Greater Sage-grouse

The Greater Sage-grouse was a candidate species for listing under provisions of the ESA as determined by the FWS and documented in a March 5, 2010, Federal Register notice declaring that listing of the Greater Sage-grouse was warranted but precluded. On September 22, 2015, the FWS determined the Greater Sage-grouse does not require protection under the Endangered Species Act. Greater Sage-grouse are distributed in sagebrush habitat throughout the HPD. Nesting and brood-rearing habitat is sometimes associated with the lek and sometimes found at a distance from the lek in sagebrush habitat. Within the HPD there are approximately 3,624,598 acres of Greater Sage-grouse core areas (version 3) that occur on public, private, state, and other Federal lands. Greater Sage-grouse core areas designated by the State of Wyoming have been

established to help conserve Greater Sage-grouse populations and associated habitats. The BLM is currently in the process of refining management policy for implementing the core area strategy. RMP amendments have been developed to provide additional protections for core/connectivity area habitats and further limit degradation and fragmentation from human activity. The WGFD has identified core areas which represent these relatively productive areas and have suggested special management for these areas.

3.3.9.2. Raptors

Raptors include eagles, hawks, owls, falcons, and vultures. Ten species of diurnal raptors and five species of owls are known or suspected to occur within the HPD. Nine of the 10 diurnal raptor species breed in Wyoming; the remaining species—the rough-legged hawk—is a winter resident only. Four of the owl species are year-round residents in the state, while the snowy owl is a winter resident only. Raptors can be found collectively in all vegetative types in the HPD.

3.3.9.3. Threatened and Endangered and BLM Sensitive Species

Section 7 of the ESA requires BLM land managers to ensure that any action authorized, funded, or carried out by the BLM is not likely to jeopardize the continued existence of any threatened or endangered species and that it avoids any appreciable reduction in the likelihood of recovery of affected species. Consultation with the FWS is required on any action proposed by the BLM or another Federal agency that affects a listed species or that jeopardizes or modifies critical habitat.

The BLM's Special Status Species Policy outlined in BLM Manual 6840, Special Status Species Management, is to conserve listed species and the ecosystems on which they depend, and to ensure that actions authorized or carried out by the BLM are consistent with the conservation needs of special status species and do not contribute to the need to list any of these species. The BLM's policy is intended to ensure the survival of those plants and animals that are rare or uncommon, either because they are restricted to specific uncommon habitat or because they may be in jeopardy due to human or other actions. The policy for Federal candidate species and BLM sensitive species is to ensure that no action that requires Federal approval should contribute to the need to list a species as threatened or endangered.

Other management direction is based on RMP management objectives, activity level plans, and other aquatic habitat and fisheries management direction, including 50 CFR 17, and the BLM's Land Use Planning Handbook, Appendix C, Part E, Fish and Wildlife.

Federally-listed species that may be present are:

<u>Black-Footed Ferret</u>

The black-footed ferret (*Mustela nigripes*) was first listed as endangered on March 11, 1967, as a precursor to the ESA of 1973. Black-footed ferrets are almost exclusively associated with prairie dogs and prairie dog towns. In addition to using prairie dogs as a food source, black-footed ferrets utilize prairie dog burrows for shelter, breeding, and brood-rearing. The size and density of prairie dog towns may be the most important factors comprising suitable habitats for

black-footed ferrets. Black-footed ferrets are not normally found in black-tailed prairie dog towns or complexes less than 80 acres in size, or in white-tailed prairie dog towns or complexes less than 200 acres in size (BLM 2005a).

On March 6, 2013, the FWS issued a letter acknowledging 'block clearance' for the State of Wyoming in response to a request from the WGFD. This letter provides acknowledgement that the likelihood of identifying wild ferrets in Wyoming, outside of those resulting from reintroductions, is distinctly minimal. Consequently, the Service no longer recommends surveys for the black-footed ferret in either black- or white-tailed prairie dog towns in the State of Wyoming. The Service recommends that project proponents and Federal land management agencies protect all prairie dog towns or complexes for their value to the prairie ecosystem and the many species that rely on them.

Blowout Penstemon

The blowout penstemon is endangered at the Federal level based on its restricted distribution to open, early-successional habitat and regional endemic range in the Nebraska Sandhills Prairie and the Great Divide Basin in Wyoming. Habitat for blowout penstemon consists of early successional sand dunes and blowouts. Critical habitat for the blowout penstemon is not designated within the HPD.

Colorado Butterfly Plant

The Colorado butterfly plant is a member of the Evening primrose family and is currently listed as threatened under the ESA. The plant is found in southeastern Wyoming, north-central Colorado, and extreme western Nebraska. The Colorado butterfly plant is typically found in wetlands habitats along meandering stream channels on the high plains. Critical habitat in Wyoming has been designated in Platte and Laramie Counties.

Northern Long-Eared Bat

The Northern long-eared bat was listed as threatened under the ESA on May 4, 2015. Northern long-eared bats are found throughout eastern and central North America and occur in the extreme northeast of Wyoming (Campbell, Crook, and Weston counties). Primary threats to the species include white-nose syndrome (WNS), alterations to access and climate of hibernacula, human disturbance, and loss of forest habitat for summer roosts. Critical habitat has not yet been proposed.

Preble's Meadow Jumping Mouse

The Preble's meadow jumping mouse is a subspecies of meadow jumping mouse, endemic to Colorado and Wyoming. It is found nowhere else in the world. It is listed as threatened under the ESA in Colorado, but was removed from ESA protections in Wyoming on July 10, 2008. On August 4, 2011, its protection under the ESA was reinstated in Wyoming. However, no critical habitat has been designated in Wyoming. In the HPD, it is known to occur in Platte, Goshen, and Converse counties. Typical habitat for Preble's is comprised of well-developed plains riparian

vegetation with adjacent, relatively undisturbed grassland communities and a nearby water source. These riparian areas include a relatively dense combination of grasses, forbs, and shrubs. Preble's are known to regularly range outward into adjacent uplands to feed and hibernate.

Species Affected by North Platte River Drainage

Several T&E species listed under the ESA rely on habitats found within the Platte River System. Platte River species include the whooping crane, least tern, piping plover, pallid sturgeon, and western prairie fringed orchid. Impacts to these species should be considered when proposed actions may lead to consumptive use of water or affect water quality downstream in the Platte River. Platte River Species Critical Habitat has been delineated in Converse, Goshen, Natrona, Niobrara, and Platte counties within the HPD.

Ute Ladies'-Tresses

The Ute ladies'-tresses is an ESA threatened species. The Ute ladies'-tresses, is a local endemic orchid known to occur in Converse, Goshen, and Niobrara counties. More than 50 percent of the continental range of this species occurs in Wyoming. Habitat for this perennial orchid includes riparian and wet meadow habitats. Critical habitat has not been designated for this species.

Chapter 4

ENVIRONMENTAL IMPACTS

4.1 Introduction

As previously stated, the issuance of oil and gas leases is an administrative action. Nominated leases are reviewed and stipulations are attached (see Common to All Alternatives Section below) to ensure that leasing is in conformance with the approved land use plan. On-the-ground impacts would occur only after a nominated parcel is sold, a subsequent lease is issued, and the lessee applies for and receives approval to conduct activities on the lease.

The BLM cannot determine at the leasing stage whether or not a proposed parcel will actually be sold and, if it is sold and a lease is issued, whether or not the lease would be explored or developed. Because well location(s) cannot be determined at this point, the impacts discussed in this chapter are not site-specific. Additional site-specific NEPA analysis would be conducted at the time an APD or facility application is submitted and would provide site-specific analysis for that well location or facility. Additional conditions of approval (mitigation) may be applied at that time.

According to the Tenth Circuit Court of Appeals, site-specific NEPA analysis at the leasing stage may not be possible absent concrete development proposals. Whether such site-specific analysis is required depends upon a fact-specific inquiry. Often, where environmental impacts remain unidentifiable until exploration can narrow the range of likely drilling sites, filing an APD may be the first useful point at which a site-specific environmental analysis can be undertaken (Park County Resource Council, Inc. v. U.S. Department of Agriculture, 10th Cir., April 17, 1987). In addition, the Interior Board of Land Appeals (IBLA) has ruled that, "BLM is not required to undertake a site-specific environmental review prior to issuing an oil and gas lease when it previously analyzed the environmental consequences of leasing the land…" (Colorado Environmental Coalition, et. al, IBLA 96-243, decided June 10, 1999). However, when site-specific impacts are reasonably foreseeable at the leasing stage, NEPA requires the analysis and disclosure of such reasonably foreseeable site-specific impacts (N.M. ex rel. Richardson v. BLM, 565 F.3d 683, 718-19 (10th Cir. 2009). The BLM has not received any development proposals concerning the lease sale parcels addressed in this EA.

Recreation and Special Management Areas, Water Resources, and VRM were found to not have any impacts if the proper stipulations were attached as directed from the appropriate RMP in Section 4.2, Common to All Alternatives. Since the following discussion concerns the deferral or offer of each parcel by alternative and none of these resources affect that determination, these resources will not be analyzed further beyond Section 4.2.

Table 4.1 below is a comparison of the parcels offered by alternative. It is provided here as a reference for the discussions in the rest of this chapter.

Table 4.1 Comparison of Parcels Offered in Alternatives A and B

Offered	Number Parcels	Federal Mineral Acres	Federal Surface Acres
Alternative A	0	0	0
Alternative B	39	22,495	2,271

4.2 Common to All Alternatives

The following stipulations will be applied to the noted lease sale parcels in all alternatives. Three categories of stipulations are used in the following sections. No Surface Occupancy (NSO) is the most stringent. Under an NSO, use or occupancy of the land surface for fluid mineral exploration or development is prohibited to protect identified resource values. Controlled Surface Use (CSU) is less stringent. Under a CSU, use and occupancy is allowed (unless restricted by another stipulation) but identified resource values require special operational constraints that may modify the lease rights. CSU is used for operating guidance, not as a substitute for the NSO or Timing stipulations. Timing Limitation Stipulations (TLS) prohibit surface use during specified time periods to protect identified resource values. This stipulation does not apply to the operation and maintenance of production facilities unless the findings of analysis demonstrates the continued need for such mitigation and that less stringent, project specific mitigation measures would be insufficient.

4.2.1 Lands and Realty Management

Leasing affords the lessee the exclusive right to explore and develop the leased property. Leases are issued with standard terms and conditions, and are subject also to standard lease stipulations, standard lease notices, and specific lease stipulations derived from the applicable RMP. As noted earlier, leasing is an administrative action and generally does not authorize surface disturbing activities. However, the concerns associated with oil and gas development in proximity to dense residual development warrants a brief summary of the types of impacts that might result if development occurs.

Oil and gas development is initiated by submission of an NOS or APD. Prior to that, the operator has usually initiated land owner or surface management entity contact, surveyed a well location and access route, and developed a surface use plan and drilling plan (components of the NOS or APD), that includes the technical details of the drilling proposal. Construction of the access road and well pad require removal of native vegetation, stockpiling of topsoil for later use in surface reclamation, grading of the road and well pad, and fencing to secure the site. Location size depends on many factors including depth to the target formation, type and size of drilling rig, drilling and completion techniques, and the number of planned well bore completions. Well locations can range from a few acres to as many as 40 acres in size. Rig components are moved to the well location by large trucks, requiring as many as 50 truckloads. Other equipment and supplies, as well workers access the location by trucks and pickups. Well site preparation and transportation to and from the rig results in dust, noise and increased activity at and near the well location. Well drilling is a continuous operation resulting in noise, dust, increased activity and lighting impacts 24 hours a day throughout the drilling period, sometimes requiring 30 to 45 days for completion. Deeper wells and multiple well bore completions extend this period of activity

accordingly. Once a well is completed, activity levels drop dramatically, and the well is either reclaimed if a dry hole, or put into production. Producing wells require less frequent, but routine access for maintenance, collection and transportation of produced oil, and other activities. Pipelines, powerlines and other production related activities are authorized by sundry notice or rights-of-way, and result in surface disturbing impacts similar to those for well pad and road construction. Typical industry practices as well as BLM regulations and policies provide measures to mitigate these impacts. Setbacks reduce the severity of impacts on residential users by providing a buffer between homesites and development activities like noise, light, and dust.

Drilling by its nature crosses geologic formations, some of which are water bearing zones. Some of those water bearing formations serve as potable water sources for residential or livestock uses. BLM regulations require well bore casing to isolate the well bore and drilling fluids from aquifers. Setbacks also increase protections for potable water sources.

Following submission of the APD with a discreet development proposal, the BLM undertakes an environmental review of the proposal to discern site specific resource impacts, and appropriate mitigation measures.

4.2.2 Heritage Resources

Reviews of individual RMPs revealed that protective stipulations need to be applied to historic properties within proposed lease sale parcels described below:

One parcel in the CFO, WY-1608-038 has the following stipulation applied for the Bozeman Trail route:

> *CSU (1) Surface occupancy or use within 3 miles or visual horizon of the historic trail, whichever is closer, may be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Casper Field Office GIS database; (3) protecting cultural and scenic values of the Bozeman Trail.*

Parcel WY-1608-014 in the NFO has the following stipulation applied:

> *CSU (1) Surface occupancy or use within 1/4 mile or visual horizon of the trail, whichever is closer, may be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting cultural and scenic values of the Cheyenne-Deadwood Trail.*

4.2.3 Paleontology

Two parcels within the NFO, WY-1608-018 and WY-1608-019, have the following stipulation attached to mitigate paleontological resources.

CSU (1) Surface occupancy or use may be restricted or prohibited if paleontological sites exist unless paleontological sites are avoided or the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting Lance Creek Fossil Area paleontological values.

4.2.4 Wildlife and Special Status Species (Plants and Animals)

The current RMPs have evaluated the need to protect habitat necessary for the success of species identified through applicable laws, regulations and policies.

4.2.4.1 Greater Sage-grouse

Table 4.2 contains a list of parcels with Greater Sage-grouse stipulations.

Table 4.2 August 2016 Oil and Gas Lease Parcels with Greater Sage-grouse Stipulations

Parcel Number	Stipulation(s)	Field Office
WY-1608-040	CFO 1, CFO 2	CFO
WY-1608-041	CFO 2	CFO
WY-1608-042	CFO 1, CFO 2	CFO
WY-1608-008	NFO 1	NFO
WY-1608-009	NFO 1, NFO 2	NFO
WY-1608-011	NFO 1	NFO
WY-1608-012	NFO 1, NFO 2	NFO
WY-1608-014	NFO 1	NFO
WY-1608-024	NFO 1	NFO
WY-1608-025	NFO 1	NFO
WY-1608-032	NFO 1	NFO
WY-1608-033	NFO 1	NFO
WY-1608-034	NFO 1	NFO

The following stipulations apply to Table 4.2:

CFO 1 - NSO (1) as mapped on the Casper Field Office GIS database; (2) to protect occupied Greater Sage-grouse leks and associated seasonal habitat, life-history, or behavioral needs of Greater sage-grouse in proximity to leks from habitat fragmentation and loss, and protect Greater Sage-grouse populations from disturbance within an 0.25-mile radius of the perimeter of occupied Greater Sage-grouse leks outside designated PHMAs (Core and Connectivity).

CFO 2 – TLS (1) Mar 15 to July 15; (2) as mapped on the Casper Field Office GIS database; (3) no surface use to seasonally protect Greater sage-grouse breeding, nesting, and early brood-rearing habitats outside designated PHMA (Core and Connectivity), within two miles of an occupied lek.

NFO 1 - TLS (1) Mar 15 – Jun 30; (2) as mapped on the Newcastle Field Office GIS database; (3) no surface use to seasonally protect Greater Sage-Grouse breeding, nesting and early brood-rearing habitats outside designated PHMA (Core and Connectivity), within two miles of an occupied lek.

NFO 2 – NSO (1) as mapped on the Newcastle Field Office GIS database; (2) to protect occupied Greater sage-grouse leks and associated seasonal habitat, life-history, or behavioral needs of Greater sage-grouse in proximity to leks from habitat fragmentation and loss, and protect Greater sage-grouse populations from disturbance within an 0.25-mile radius of the perimeter of occupied Greater sage-grouse leks outside designated PHMAs (Core and Connectivity).

4.2.4.2. Raptors

Table 4.3 contains a list of parcels with raptor stipulations.

Table 4.3 August 2016 Oil and Gas Lease Sale Parcels with Raptor Stipulations

Parcel Number	Stipulation(s)	Field Office
WY-1608-036	CFO 1	CFO
WY-1608-037	CFO 1	CFO
WY-1608-038	CFO 1	CFO
WY-1608-001	NFO 1	NFO
WY-1608-002	NFO 1	NFO
WY-1608-004	NFO 1	NFO
WY-1608-007	NFO 1	NFO
WY-1608-009	NFO 1	NFO
WY-1608-010	NFO 1	NFO
WY-1608-011	NFO 1	NFO
WY-1608-013	NFO 1	NFO
WY-1608-014	NFO 1	NFO
WY-1608-018	NFO 1	NFO
WY-1608-019	NFO 1	NFO

The following stipulations apply to Table 4.3:

CFO 1 - TLS (1) Feb 1 to Jul 31; (2) as mapped on the Casper Field Office GIS database; (3) protecting nesting Raptors.

NFO 1 - TLS (1) Feb 1 to Jul 31; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting nesting Raptors.

4.2.4.3. Threatened and Endangered and BLM Sensitive Species

The following Lease Stipulation No. 2 is applied to all parcels:

> *The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. The BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. § 1531 et seq., including completion of any required procedure for conference or consultation.*

4.3 Direct and Indirect Impacts

Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and occur later in time or farther removed in distance , but are still reasonably foreseeable.

4.3.1 Air Resources

4.3.1.1 Air Quality

4.3.1.1.1 Alternative A – No Action

Under the No Action Alternative, none of the 39 parcels in the HPD would be offered for sale. No oil and gas development would occur on these parcels. Ongoing oil and gas development would continue on surrounding Federal, private, and state leases.

A decision not to offer the 39 parcels for sale would not affect existing uses of these parcels. The parcels are used primarily for livestock grazing, with some dispersed recreation such as hunting and hiking. These uses typically entail vehicle travel for access and that would be expected to continue at current rates.

Selection of the No Action Alternative would not preclude the re-nomination of a deleted parcel from this sale at some point in the future, as long as the area remains open to fluid mineral leasing.

4.3.1.1.2 Alternative B – Proposed Action

Offering all 39 parcels for competitive sale would have no direct impacts to air quality. Any potential effects to air quality would occur when the leases were sold and subsequently developed. APD permitting trends within the HPD varies among the three field offices.

Over the last 10 years including 2010, leasing Federal oil and gas mineral estate has resulted in a total of 13,436 APDs approved in the BFO, 882 APDs in the CFO, and 327 APDs in the NFO. A total of 14,645 APDs have been approved in the HPD over these last ten years for an annual average of 1,465 APDs; 1,344 APDs per year in the BFO, 88 APDs per year in the CFO and 33 APDs per year in the NFO. As of 2010, there are over 39,000 producing wells in the HPD consisting of: the BFO with over 31,000, the CFO with over 5,000 and the NFO with over 3,000. CBNG development accounts for a large proportion of the APDs approved within the HPD, specifically within the BFO, since the late 1990s. Appendix E, Hydraulic Fracturing White Paper, Section II, Operational Issues/Gas emissions (page 2) is incorporated by reference.

Potential impacts of development could include increased air borne soil particles associated with the construction of new well pads, pipelines, or roads, exhaust emissions from drilling equipment, compressors, vehicles, dehydration and separation facilities, and volatile organic compounds during drilling or production activities. The amount of increased emissions cannot be quantified since it is unknown 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 would occur. Emissions of all regulated pollutants under the Clean Air Act would be evaluated by the WDEQ and, in some instances, by the BLM at the time that a specific development project is proposed.

It is not known whether the petroleum resources specific to the leases in the Proposed Action are gas or oil, or a combination thereof. The density of drilling locations depends upon the technology feasible and available (vertical, directional, or horizontal), and the geology of the hydrocarbon-bearing zone. As a result, the specific numbers of wells that could potentially be drilled as a result of the sale of the nominated parcels and subsequent issuance of leases is unknown. However, the RFD considers these assumptions and, on a field office-wide basis, is still valid for the Buffalo, Casper and Newcastle field offices.

4.3.1.2 Green House Gas Emissions

4.3.1.2.1 Alternative A – No Action

Under the No Action Alternative, none of the 39 parcels in the HPD would be offered for sale. No oil and gas development would occur on these parcels. Ongoing oil and gas development would continue on surrounding Federal, private, and state leases.

A decision not to offer the 39 subject parcels for sale would not affect existing uses of these parcels. The parcels are used primarily for livestock grazing, with some dispersed recreation such as hunting and hiking. These uses typically entail vehicle travel for access, and that would be expected to continue at current rates.

Selection of the No Action Alternative would not preclude the re-nomination of a deleted parcel from sale at some point in the future, as long as the area remains open to fluid mineral leasing.

4.3.1.2.2 Alternative B – Proposed Action

Offering all 39 parcels for competitive sale would have no direct impacts to GHG emissions. Any potential effects to GHG emissions would occur when the leases were sold and subsequently developed. APD permitting trends within the HPD varies among the three field offices.

In regard to future development, the assessment of GHG emissions and climate change is in its formative phase. While it is not possible to accurately quantify potential GHG emissions in the affected areas as a result of making the proposed tracts available for leasing, some general assumptions can be made: issuing the proposed tracts may contribute to new wells being drilled.

The Center for Climate Strategies prepared the Wyoming Greenhouse Gas Inventory and Reference Case Projection 1990-2020 (Inventory) for the WDEQ through an effort of the Western Regional Air Partnership. This *Inventory* report presented a preliminary draft GHG emissions inventory and forecast from 1990 to 2020 for Wyoming. This report provides an initial comprehensive understanding of Wyoming's current and possible future GHG emissions. The information presented provides the state with a starting point for revising the initial estimates as improvements to data sources and assumptions are identified.

The *Inventory* report discloses that activities in Wyoming accounted for approximately 56 million metric tons (mmt) of *gross* carbon dioxide equivalent (CO_2e) emissions in 2005, an amount equal to 0.8% of total U.S. gross GHG emissions. These emission estimates focus on activities in Wyoming and are *consumption-based;* they exclude emissions associated with electricity that is exported from the state. Wyoming's gross GHG emissions increased 25% from 1990 to 2005, while national emissions rose by only 16% from 1990 to 2004. Annual sequestration (removal) of GHG emissions due to forestry and other land uses in Wyoming are estimated at 36 mmtCO_2e in 2005. Wyoming's per capita emission rate is more than four times greater than the national average of 25 mmtCO_2e/yr. This large difference between national and state per capita emissions occurs in most of the sectors – Wyoming's emission per capita considerably exceeds national emissions per capita for electricity, industrial, fossil fuel production, transportation, industrial process, and agriculture. The state's strong fossil fuel production and other industries with high fossil fuel consumption intensity, large agriculture industry, and large distances could be the reasons for the higher per capita intensity in Wyoming. This phenomenon is primarily the result of a low population base (small denominator). Between 1990 and 2005, per capita emissions in Wyoming increased, mostly due to increased activity in the fossil fuel industry, while national per capita emissions have changed relatively little.

Wyoming's gross GHG emissions are expected to continue to grow to 69 mmtCO_2e by 2020, 56% above 1990 levels. As shown in figure ES-3 of the *Inventory*, demand for electricity is projected to be the largest contributor to future emissions growth, followed by emissions associated with transportation. Although GHG emissions from fossil fuel production had the greatest increase by sector from 1990 to 2005, the growth from this sector is projected to decline due to the assumption that carbon dioxide emissions from venting at processing plants would decrease.

As of 2010, there were approximately 59,500 producing oil and gas wells in the state and approximately 39,500 producing wells in the HPD. The BFO had over 31,000, the CFO over 5,000, and the NFO over 3,000. As of that same time, approximately 30,500 producing oil and gas wells in Wyoming were under Federal administration with about 18,000 of these within the HPD. The BFO had over 12,500, the CFO over 4,000, and the NFO almost 1,500. This accounted for approximately 59 percent of the total Federal wells in Wyoming and 66 percent of the total wells. Therefore, based on the above information, GHG emissions from all wells within the HPD amounted to approximately 12.94 metric tons (mt) annually (19.6 mt X 0.66 = 12.94 mt) assuming steady production and emission venting.

Based on this emission factor, each potential well that may be drilled on these parcels, if leased, could emit approximately 0.00059 mt of CO_2e. It is unknown what the drilling density may be for these parcels, if they were to be developed. Therefore, it is impossible to predict what level of emissions could occur from development at this stage under this alternative.

4.3.1.3 Visibility

4.3.1.3.1 Alternative A – No Action

Under the no action alternative, none of the 39 parcels in the HPD would be offered for sale. No oil and gas development would occur on these parcels. Ongoing oil and gas development would continue on surrounding Federal, private, and state leases.

A decision not to offer the 39 subject parcels for sale would not affect existing uses of these parcels. The parcels are used primarily for livestock grazing, with some dispersed recreation such as hunting and hiking. These uses typically entail vehicle travel for access, and that would be expected to continue at current rates.

Selection of the No Action Alternative would not preclude the re-nomination of a deleted parcel from sale at some point in the future, as long as the area remains open to fluid mineral leasing.

4.3.1.3.2 Alternative B – Proposed Action

Offering all 39 parcels for competitive sale would have no direct impacts to visibility. Any potential effects to visibility would occur when the leases were sold and subsequently developed particularly during construction. Data collection for visibility would continue.

4.3.1.4 Mitigation Measures for Air Resources

Best management practices (BMP) such as those used to reduce fugitive dust emissions and GHG emissions and to maintain air quality, would help mitigate effects to these resources. Further analysis at the APD and facility application stages of development may examine possible mitigations to alleviate site-specific impacts.

The BLM holds regulatory jurisdiction over portions of natural gas and petroleum systems identified in the EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks*: 1990-2006* documents. Exercise of this regulatory jurisdiction has led to development of BMPs designed to reduce emissions from field production and operations. Analysis and approval of future development on the lease sale parcels would include applicable and reasonable BMPs as conditions of approval (COA) in order to reduce or mitigate GHG emissions. Additional measures developed at the project development stage could be incorporated as COAs in the approved APD.

Such mitigation measures may include, but are not limited to:

- Flare hydrocarbon and gases at high temperatures in order to reduce emissions of incomplete combustion through the use of multi-chamber combustors;
- "Green" (flareless) completions;
- Water dirt roads during periods of high use in order to reduce fugitive dust emissions;
- Require that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored;
- Installation of liquids gathering facilities or central production facilities to reduce the total number of sources and minimize truck traffic;
- Use of natural gas fired or electric drill rig engines;
- Use selective catalytic reducers on diesel-fired drilling engines; and,
- Re-vegetate areas of the pad not required for production facilities to reduce the amount of dust.

According to the *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2006* by the EPA, data shows that adoption by industry of the BMPs proposed by the EPA's Natural Gas Energy Star program has reduced emissions from oil and gas exploration and development. The BLM would work with industry to facilitate the use of the relevant BMPs for operations proposed on Federal mineral leases where such mitigation is consistent with agency policy.

4.3.1.5 Residual Impacts

No residual impacts would continue from offering and issuing the leases. Any proposed development activities would be reviewed when an APD or other facility application is received. At the time of approval, further mitigation may be applied to reduce adverse impacts.

4.3.1.6 Monitoring and/or Compliance

Monitoring at the stations listed in Chapter 3 would continue, as would data collection at the Thunder Basin National Grasslands and Cloud Peak Wilderness IMPROVE monitoring sites. Monitoring and compliance are an integral part of lease administration. As development increases, monitoring and compliance increases as future APDs or other facility applications are approved. Site-specific review would help in application of these requirements.

4.3.2 Heritage Resources

4.3.2.1 Alternative A – No Action

Under the No Action Alternative, none of the 39 parcels in the HPD would be offered for sale. No oil and gas development would occur on these parcels. Ongoing oil and gas development would continue on surrounding Federal, private, and state leases. A decision not to offer the 39 subject parcels for sale would not impact cultural resources. Selection of the No Action Alternative would not preclude the re-nomination of a deleted parcel from sale at some point in the future, as long as the area remains open to fluid mineral leasing.

4.3.2.2 Alternative B – Proposed Action

Under this alternative, all 39 parcels would be offered for lease. Known historic properties in the proposed parcels can most likely be avoided by surface disturbance activities. If a historic property within a lease sale parcel cannot be avoided, the BLM has the discretion to modify or deny the proposal.

The field offices will consider site specific impacts to historic properties resulting from possible future actions on the remaining leases. Proposed impacts would be avoided or mitigated in consultation with the Wyoming SHPO, tribes and interested parties through compliance with Section 106 of the NHPA. The field offices will consult with interested tribes if potential TCPs or sacred sites are identified during the cultural resource inventory.

4.3.2.3 Mitigation Measures

If necessary, additional mitigation may be required at the APD stage when all cultural resources potentially affected by a project are located, and specific impacts are known.

4.3.2.4 Residual Impacts

No residual impacts would occur from offering the parcels for sale and issuing the leases. The field office may apply mitigation to reduce adverse impacts.

4.3.2.5 Monitoring and/or Compliance

After leasing, when a project is constructed in an area with a high potential for buried cultural material, archaeological monitoring may be included as a condition of approval. Monitoring may also be required if development would occur near a sensitive site. Construction monitoring is performed by a qualified archeologist working in unison with construction crews. If buried cultural resources are located by the archeologist, construction is halted and the BLM consults with the Wyoming SHPO on mitigation or avoidance. Tribes occasionally recommend tribal monitors for construction projects. Individual field offices consider applying such recommendations as conditions of approval to the drilling permits at the APD stage.

4.3.3 Paleontology Resources

4.3.3.1 Alternative A – No Action

Under the No Action Alternative, none of the 39 parcels in the HPD would be offered for sale. No oil and gas development would occur on these parcels. Ongoing oil and gas development would continue on surrounding Federal, private, and state leases. A decision not to offer the 39 subject parcels for sale would not impact paleontological resources. Selection of the No Action Alternative would not preclude the re-nomination of a deleted parcel from sale at some point in the future, as long as the area remains open to fluid mineral leasing.

4.3.3.2 Alternative B – Offer All Parcels for Sale

Under this alternative, all 39 parcels would be offered for lease with no parcels deferred for paleontological resources issues. Lease stipulations requiring inventory prior to surface disturbance would be added to two parcels indicating that surface occupancy may be restricted or prohibited if paleontological resources are present. The field offices would consider site specific impacts during the APD phases. Proposed impacts would be avoided or mitigated.

4.3.3.3 Mitigation Measures

Mitigation may be required at the APD stage when all paleontological resources potentially affected by a project are located, and specific impacts are known.

4.3.3.4 Residual Impacts

No residual impacts would occur from offering the parcels for sale and issuing the leases. The field office may apply mitigation to reduce adverse impacts if development were to occur later.

4.3.3.5 Monitoring and/or Compliance

After leasing, when a project is constructed in an area with a high potential for paleontological resources, mitigation may be included as a condition of approval. Inventory or monitoring may also be required if development would occur in a sensitive area. Individual field offices consider

the need for inventory, monitoring, or mitigation applying recommendations as conditions of approval to the drilling permits at the APD stage.

4.3.4 Socioeconomic Resources

4.3.4.1 Alternative A – No Action

Under this alternative none of the 39 parcels would be made available for sale and no development under those leases would occur. The proposed lease sale parcels are located in Converse, Crook, Niobrara and Weston Counties in Wyoming. As these counties rely heavily on energy development revenue, the communities in the leasing areas are likely to be negatively impacted by loss of potential revenue. It is an assumption that the No Action Alternative (no lease option) may result in a reduction in domestic production of oil and gas. This would likely result in reduced Federal and state royalty income, and the potential for Federal land to be drained by wells on adjacent private or state land.

4.3.4.2 Alternative B – Proposed Action

Under this alternative, all 39 parcels would be offered for lease. This would result in an increase in revenue for the Federal and state governments compared to Alternative A, where no parcels are offered for sale. The actual amount of the increase is not known. At the leasing stage the BLM cannot predict whether or not any of the parcels will actually be developed or what level of development would occur. Subsequent development and production would result in greater royalties than Alternative A.

4.3.5 Wildlife and Special Status Species (Plant and Animal)

4.3.5.1 Alternative A – No Action

Under the No Action Alternative, none of the 39 parcels would be offered for sale. No oil and gas development would occur on these parcels if not offered for lease. Ongoing oil and gas development would continue on surrounding Federal, private, and state leases.

A decision to not offer for sale the 39 subject parcels would not affect existing uses of these parcels. These parcels are used primarily for livestock grazing, with some dispersed recreation such as hunting and hiking. These uses typically entail vehicle travel for access, and that would be expected to continue at current rates.

Selection of the No Action Alternative would not preclude the re-nomination of a deleted parcel from sale at some point in the future, as long as the area remains open to fluid mineral leasing.

Impacts to Greater Sage-grouse core areas/connectivity habitats would continue from those activities associated with current land uses, such as private and state surface or mineral development, recreation, and agriculture.

4.3.5.2 Alternative B – Proposed Action

Under this alternative, all 39 parcels would be offered for sale. Well-pad, road, and pipeline development into areas currently devoid of surface disturbance could result in habitat fragmentation for some species. This habitat impact could affect a variety of species, including Greater Sage-grouse, mule deer, white-tailed deer, antelope, elk, and various non-game species. Post lease development on the parcels could result in short-term and long-term losses of wildlife habitat. Short-term habitat loss would include all initial surface disturbance associated with the project and typically would be on-going until those portions of a well pad not needed for production operations, road disturbance outside the running surface or ditches, and pipeline disturbance are reclaimed. Long-term habitat loss would include those areas needed for production operations for the life of the well.

Some species of wildlife are more sensitive to noise and disturbance than other species, while other species habituate to types of noise or disruption. On the other hand, certain magnitudes and frequency of noise may interrupt wildlife communication and adversely impact wildlife. Depending on the intensity and frequency of occurrence of the disruption, additional disruption during critical periods (*e.g.*, winter, nesting, parturition) can impact wildlife survival and productivity.

Greater Sage-grouse

There are many sources of habitat fragmentation, all of which may affect the Greater Sage-grouse. Industrial development, livestock grazing, mining, gravel pit operations, oil and gas activity, land exchanges and disposal, vegetation manipulation, fuel reduction projects, and other activities may disturb and fragment natural habitat conditions. Structures such as power lines, towers, and industrial disruptive activities may cause avoidance and abandonment of habitat. Livestock grazing, fuels treatments, and weed infestations are factors which may cause habitat degradation depending upon severity, intensity, and design. West Nile virus, which recently has had lethal effects on Greater Sage-grouse in parts of Wyoming, could cause increased mortality and reduce Greater Sage-grouse survival.

Greater Sage-grouse have been declining across the west. Population levels throughout the HPD declined during the mid-1990s. Population numbers increased to a peak in 2006 and have declined significantly in the HPD since. In the last couple of years, population numbers seem to have rebounded slightly. Population numbers have varied throughout the HPD based on specific local conditions, with some areas showing little change while other areas have noticed dramatic differences. To promote Greater Sage-grouse conservation, additional restrictions on oil and gas leases are needed to limit potential adverse impacts from any development activities. At the time development activities are proposed, the BLM would conduct a site-specific review of the proposal and potential disturbance within the current Greater Sage-grouse habitat boundaries (such as the Wyoming Governor's core areas). The BLM may require additional avoidance and/or impact minimization measures in order to manage Greater Sage-grouse habitat in support of Wyoming's Greater Sage-grouse conservation strategy and the WGFD's Greater Sage-grouse objectives. These measures may include, but are not limited to, density/disturbance limitations and surface use and timing restrictions in proximity to certain habitats (e.g., severe winter relief

habitat, Greater Sage-grouse leks, etc.). New RMP amendments provide restrictions and mitigation for surface use activities for distances and time periods. Such restrictions could be applied as COAs for exploration and development activities associated with the lease. These measures may be necessary to meet BLM policy goals for managing Greater Sage-grouse habitat and populations as special status species as directed in BLM Manual 6840.

As noted in Section 1.2, RODs were signed September 21, 2015, amending the Casper and Newcastle RMPs, and approving the Buffalo RMP revision. These RMP amendments and revision provided for public input including scoping and comments. The goal of the RMP amendments/revision is to implement a Greater Sage-grouse conservation strategy consistent with the Wyoming Governor's Executive Order 2011-5 and BLM policy.

With application of SOPs, applied mitigation, required design features and conditions of approval identified for Greater Sage-grouse under the proposed action and RMP amendments/revision, impacts caused by surface-disturbing and disruptive activities would be minimized.

Raptors

Surface disturbing and/or disruptive activities from February 1 to July 31, may cause impacts to nesting raptors, if present. The primary impact would be from nesting disturbance which could result in nest abandonment and/or increased chick mortality. Raptors such as ferruginous hawks, golden eagles, and bald eagles are more sensitive to vehicular traffic than are others. Site-specific wildlife surveys may be required at the APD stage to identify occupied habitats.

Threatened and Endangered and BLM Sensitive Species

Surface-disturbing activities, such as well pad construction, road construction, and other mechanized disturbance could impact potential habitats for special status plants and animals, including undocumented populations. Such activities fragment habitats and alter plant community characteristics, which can isolate or adversely affect populations of special status species. Long-term impacts such as habitat fragmentation and isolation of populations are difficult to mitigate; however, short-term impacts from surface disturbance are mitigated by reclamation and weed control. If habitat is present, site-specific surveys for all sensitive or T&E species may be required at the APD stage.

4.3.5.3 Mitigation Measures

Adding stipulations for parcels within the Casper and Newcastle RMP's for mapped wildlife habitat is recommended to ensure continued RMP population and habitat objectives can be maintained for wildlife species. Additional mitigation and/or COAs for any species would be identified at the development stage to further reduce impacts associated with oil and gas development.

4.3.5.4 Residual Impacts

No residual impacts would occur from offering and issuing the leases. If a lease is developed, there would be heavy construction equipment working. Due to the extent of work and the surface disturbance and disruptive activities caused by construction activities, it is possible that wildlife populations and habitats could be impacted by these activities. These activities would be further analyzed during the site-specific review conducted when an APD or other facility application is received. At the time of approval, further mitigation may be applied to reduce adverse impacts.

4.3.5.5 Monitoring and/or Compliance

Continued monitoring and compliance is an integral part of lease administration. When a project is constructed in an area with suitable species' habitat, wildlife and T&E surveys and/or monitoring may be required as a condition of approval. Surveys are performed by a qualified wildlife biologist working in unison with the operator. Coordination with the WGFD on mitigation or avoidance criteria is conducted before surface disturbance or disruptive activities take place, in some instances. Individual field offices may consider applying WGFD recommendations as conditions of approval to the drilling permits at the APD stage.

Consultation with the FWS under section 7 of the ESA would take place at the APD stage, if ESA protected species could be affected by permitted development activities.

4.4 Cumulative Impacts Analysis

The cumulative impacts assessment area for this EA is the HPD which consists of the BFO, the CFO and the NFO. Analysis of cumulative impacts for RFD scenarios of oil and gas wells on public lands is presented in the respective RMPs. Potential development of all available Federal minerals in the field office was included as part of the analysis.

Under Alternative A, the No Action Alternative, there would be no cumulative impacts to any of the resources listed above except for those activities on state and private lands or other BLM authorized activities.

As of 2010, there were over 59,000 producing oil and gas wells in the state and over 39,000 producing wells in the HPD. The BFO had over 31,000, the CFO over 5,000, and the NFO over 3,000. At that same time, over 30,000 producing oil and gas wells in Wyoming were Federal with over 18,000 wells within the HPD. The BFO had over 12,500, the CFO over 4,000, and the NFO with almost 1,500. When compared to the total GHG emission estimates from the number of Federal oil and gas wells in the state, the average number of oil and gas wells drilled annually within the HPD and probable GHG emission levels represent an incremental contribution to the total regional and global GHG emission levels. As oil and natural gas production technology continues to improve in the future, it is possible that GHG emissions may be reduced. Information contained in Appendix E, Hydraulic Fracturing White Paper, Section II Operational

Issues/Water Availability and Consumption (page 4 and Attachment 1), is incorporated by reference.

Estimating the current level of emissions and projecting future production of oil and gas is difficult to forecast with the mix of drivers: economics, resource supply, demand, and regulatory procedures. The assumptions used for the projections are based on recent trends or state production trends in the near-term, and Annual Energy Outlook 2006 (AEO 2006) growth rates through 2020. These assumptions do not include any significant changes in energy prices, relative to today's prices. Large price swings, resource limitations, or changes in regulations could significantly change future production and the associated GHG emissions. Other uncertainties include the volume of GHGs vented from gas processing facilities in the future, any commercial oil shale or coal-to-liquids production, and potential emissions-reducing improvements in oil and gas production, processing, and pipeline technologies.

For cultural resources, wildlife, T&E, and sensitive species resources the cumulative impact of 39 more parcels leased under Alternative B would be an incremental increase to the overall total parcels currently leased in the state. Any development would require APD and facility applications to then analyze the impacts for proposed development. That analysis may include surveys for these resources. Cumulative impacts would be further considered and, if necessary, mitigated.

Chapter 5

Consultation and Coordination

5.1 Introduction

The issues identified in Chapter 1 (Section 1.6) are analyzed in detail in Chapter 4. The ID Team resource issues and the rationale for issues that were considered but not analyzed further (Section 1.7) were identified through the public and agency involvement process described in Sections 5.2 and 5.3.

5.2 Persons, Groups, and Agencies Consulted

Table 5.1 List of Persons, Agencies and Organizations Consulted for Purposes of this EA

Name	Purpose and Authorities for Consultation or Coordination	Findings and Conclusions
Heather O'Brien	Wyoming Game and Fish Department – Biologist	See project file
Erika Peckham	Wyoming Game and Fish Department – Biologist	See project file
Joe Sandrini	Wyoming Game and Fish Department – Biologist	See project file
Willow Hibbs	Wyoming Game and Fish Department – Biologist/Habitat Biologist	See project file

5.3 Summary of Public Participation

Public participation was initiated when this EA was entered into the HPD NEPA tracking database on November 14, 2015. A press release announcing the availability of the EA for comments was e-mailed to local media on January 19, 2016. The press release stated that the comment period for the EA would run until February 18, 2016. In addition, informational postcards were mailed to affected landowners and letters to Native American tribes in January 2016. As required by BLM leasing policy, where parcels are split estate, a notification soliciting EA review and comments was sent to the surface owner based on the surface owner information provided by the party submitting the EOI.

Table 5.2 List of Preparers

Name	Title	Responsible for
Randy Sorenson	High Plains District Resource Advisor, Energy, Minerals & Lands	Project Manager
Andrea Meeks	High Plains District, Solid Mineral Specialist	Coal
Debby Green	Buffalo Field Office, Natural Resource Specialist (NRS)	Buffalo Field Office Lead, Core Team NRS
G.L. "Buck" Damone III	Buffalo Field Office, Lead Archaeologist	Core Team Archaeologist, Cultural Resources, Paleontology
Shane Gray	Casper Field Office, Natural Resource Specialist (NRS)	Casper Field Office Lead, Wildlife, Threatened and Endangered Species, Casper Field Office Reviews and Special Status Species
Jude Carino	Casper Field Office, Archaeologist	Cultural Resources, Paleontology

Patrick Walker	Casper Field Office, Archaeologist	Cultural Resources, Paleontology
Eric Schnell	Newcastle Field Office, Physical Scientist.	Newcastle Field Office Lead
Tracy Pinter	Newcastle Field Office, Wildlife Biologist	Core Team Wildlife Biologist, Newcastle Field Office Reviews and Special Status Species
Alice Tratebas	Newcastle Field Office, Archaeologist	Archaeology, Paleontology

5.4 References

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U.S. Census 2010b. Table DP-1 Geography-Campbell County, Converse County, Crook County, Goshen County, Natrona County, Niobrara County, Weston County.

WOGCC (Wyoming Oil and Gas Conservation Commission), 2012. 2011 County Report as reported on 12/13/2012. http://wogcc.state.wy.us/CountyReport.CFM