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November 2011 Lease Parcels

High Desert District Office
280 Highway 191 North
Rock Springs, Wyoming 82003

INTRODUCTION **4**

1.0 PURPOSE AND NEED 5
1.1 CONFORMANCE WITH APPLICABLE LAND USE PLAN AND OTHER ENVIRONMENTAL ASSESSMENTS 5
1.2 FEDERAL, STATE OR LOCAL PERMITS, LICENSES OR OTHER CONSULTATION REQUIREMENTS 6
1.3 FEDERAL LEASING OF FLUID MINERALS 6
1.4 SCOPING AND PUBLIC INVOLVEMENT 7
1.4.1 SCOPING 7
1.4.2 PUBLIC PARTICIPATION 8

PROPOSED ACTION AND ALTERNATIVES **8**

2.1 ALTERNATIVE A -- NO ACTION 8
2.2 ALTERNATIVE B -- PROPOSED ACTION 9
2.3 ALTERNATIVE C-MAXIMUM PARCELS OFFERING 9

AFFECTED ENVIRONMENT **10**

3.0 DESCRIPTION OF AFFECTED ENVIRONMENT 10
3.1 SITE VISITS: 10
3.2 RESOURCE VALUES BY PARCEL: 11
3.2.3 RESOURCES COMMON TO ALL OF THE PARCELS 51
3.2.3.1 AIR RESOURCES: 51
3.2.2.1.1 AIR QUALITY 51
3.2.2.1.2 Climate and Climate Change *56*
3.2.2.1.3 Visibility *60*
3.2.2.2 WILDLIFE 67
3.2.2.3 Special Status Species *67*
3.2.2.3 LANDS WITH WILDERNESS CHARACTERISTICS 70
3.2.2.4 CULTURAL AND PALEONTOLOGY RESOURCES 72
3.2.2.5 SOCIOECONOMICS RESOURCES 72
3.2.2.6 ENVIRONMENTAL JUSTICE 74
3.2.2.7 INVASIVE, NON-NATIVE SPECIES 74
3.2.2.8 WASTES (HAZARDOUS AND/OR SOLID) 74
3.2.2.9 WATER QUALITY (SURFACE AND GROUND) 74
3.2.2.10 RECREATION 75
3.2.2.11 PUBLIC HEALTH AND SAFETY 75

ENVIRONMENTAL IMPACTS **76**

4.0 DESCRIPTION OF IMPACTS 76
4.0.1 GENERAL DISCUSSION 76
4.1 IMPACTS OF ALTERNATIVE A (NO ACTION) 76
4.1.1 SOCIOECONOMIC RESOURCE: 76
4.2 IMPACTS OF ALTERNATIVE B (PROPOSED ACTION) 77
4.2.1 AIR RESOURCES 91
4.2.2 WILDLIFE 95
4.2.3 LANDS WITH WILDERNESS CHARACTERISTICS 98
4.2.4 CULTURAL AND PALEONTOLOGICAL RESOURCES 99
4.2.5 SOILS 100
4.2.6 VEGETATION 100
4.2.7 INVASIVE, NON-NATIVE SPECIES 101
4.2.8 WASTES, HAZARDOUS OR SOLID 102

4.2.9 WATER QUALITY: SURFACE AND GROUNDWATER 102
4.2.10 WATERSHED – HYDROLOGY 104
4.2.11 LIVESTOCK GRAZING 105
4.2.12 RECREATION 105
4.2.13 VISUAL RESOURCES 106
4.2.14 PUBLIC HEALTH AND SAFETY 107
4.2.15 SOCIO-ECONOMICS 107
4.2.16 ENVIRONMENTAL JUSTICE 107
4.2.17 SOLID LEASABLE (COAL) 108
4.2.18 OTHER CONSIDERATIONS PER IM 2010-117 THAT PERTAIN TO THE AVAILABLE. 108
A. THERE IS A RISK OF DRAINAGE TO FEDERAL MINERAL RESOURCES DUE TO DEVELOPMENT OF NEARBY NON-FEDERAL PARCELS IF THE PARCEL IS NOT LEASED. 108
B. IN UNDEVELOPED AREAS, ARE NON-MINERAL RESOURCE VALUES GREATER THAN POTENTIAL MINERAL DEVELOPMENT VALUES? 108
C. STIPULATION CONSTRAINTS IN EXISTING OR PROPOSED LEASES MAKE ACCESS TO AND/OR DEVELOPMENT OF THE PARCEL OR ADJACENT PARCELS OPERATIONALLY INFEASIBLE, SUCH AS AN NSO PARCEL BLOCKING ACCESS TO PARCELS BEYOND IT OR CONSECUTIVE AND OVERLAPPING TIMING RESTRICTIONS THAT DO NOT ALLOW SUFFICIENT TIME TO DRILL OR PRODUCE THE LEASE WITHOUT HARM TO AFFECTED WILDLIFE RESOURCES. 109
D. PARCEL CONFIGURATIONS WOULD LEAD TO UNACCEPTABLE IMPACTS TO RESOURCES ON THE PARCELS OR ON SURROUNDING LANDS AND CANNOT BE REMEDIED BY RECONFIGURING. 109
E. THE TOPOGRAPHIC, SOILS, AND HYDROLOGIC PROPERTIES OF THE SURFACE WILL NOT ALLOW SUCCESSFUL FINAL LANDFORM RESTORATION AND REVEGETATION IN CONFORMANCE WITH THE STANDARDS FOUND IN CHAPTER 6 OF THE GOLD BOOK, AS REVISED. 109
F. CONSTRUCTION AND USE OF NEW ACCESS ROADS OR UPGRADING EXISTING ACCESS ROADS TO AN ISOLATED PARCEL WOULD HAVE UNACCEPTABLE IMPACTS TO IMPORTANT RESOURCE VALUES. 109
G. LEASING WOULD RESULT IN UNACCEPTABLE IMPACTS TO THE RESOURCES OR VALUES OF ANY UNIT OF THE NATIONAL PARK SYSTEM OR NATIONAL WILDLIFE REFUGE. 110
H. LEASING WOULD RESULT IN UNACCEPTABLE IMPACTS TO SPECIALLY DESIGNATED AREAS (WHETHER FEDERAL OR NON-FEDERAL) AND WOULD BE INCOMPATIBLE WITH THE PURPOSE OF THE DESIGNATION. 111
4.3 IMPACTS OF ALTERNATIVE C (MAXIMUM PARCEL OFFERING) 111
4.4 CUMULATIVE IMPACTS 111

5.0 DESCRIPTION OF MITIGATING MEASURES AND RESIDUAL IMPACTS 114

6.0 CONSULTATION/COORDINATION 114

6.1 LIST OF PREPARERS/REVIEWERS 115

7.0 REFERENCES 117

7.1 AUTHORITIES 118

BUREAU OF LAND MANAGEMENT
HIGH DESERT DISTRICT OFFICE
ENVIRONMENTAL ASSESSMENT FOR
NOVEMBER 2011 COMPETITIVE OIL AND GAS LEASE SALE
DOI-BLM-WY-030-2011-123-EA

INTRODUCTION

Bureau of Land Management's (BLM) 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), 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), and Title 43 Code of Federal Regulations (CFR) 3120.1-2(a), 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, which lists lease parcels to be offered at the auction, is published by the BLM WSO at least 90 days before the auction is held. Lease stipulations applicable to each parcel are specified in the Sale Notice. The decision as to 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 determined by BLM in consultation with the appropriate surface management agency or the private surface owner.

As part of the November 2011 lease sale preparation process the BLM WSO submitted the draft parcel list to the High Desert District Office (HDD), Kemmerer Field Office (KFO), Pinedale Field Office (PFO), Rawlins Field Office (RFO), and Rock Springs (RSFO) for review and processing. Interdisciplinary Teams (IDTs) in each Field Office, in coordination and consultation with the District Office, have reviewed the legal descriptions of the parcels to determine if they are in areas open to leasing; if appropriate stipulations have been included or additional stipulations are needed; whether or not new information is available since the land use plan was approved; if appropriate consultations have been conducted or if additional consultations are needed; and if there are special resource conditions of which potential bidders should be made aware. This Environmental Assessment (EA) has been prepared by the HDD to document this review, as well as to disclose the affected environment, the anticipated impacts, and proposed mitigation of impacts.

This EA inclusively addresses 125 parcels (179,514.5 acres) located within the four field offices of the High Desert District that have been nominated through "Expressions of Interest (EOI)" for the November 2011 Competitive Oil and Gas Lease Sale. Thirty-four (34) of the nominated parcels would be located entirely within the KFO; four (4) parcels would be located entirely within the PFO; sixty-three (63) parcels would be located in the RFO; and nineteen (19) parcels would be located entirely within the RSFO. Five (5) parcels extend across field office boundaries (parcel WY-1111-063 overlaps the RFO/RSFO boundary; parcels WY-1111-088, 089, and 090 overlap the KFO/RSFO boundary; and parcel WY-1111-098 crosses the KFO/PFO boundary).

1.0 Purpose and Need

The BLM's purpose for offering parcels and subsequent issuance of leases in the November 2011 lease sale is to provide areas for the potential exploration and development of additional oil and gas resources to help meet the nation's current and expanding need for energy sources. Wyoming is a major source of natural gas for heating and electrical energy production in the United States. The offering for sale and subsequent issuance of oil and gas leases is needed to meet the requirements of MLA, FLPMA, and the minerals management objectives in the Kemmerer, Pinedale, Rawlins, and Green River Resource Management Plans (RMP). Oil and gas leasing provides oil and gas companies the opportunity to expand existing areas of production and to locate previously undiscovered oil and gas resources to help meet the public's energy demands.

Decisions to be made based on this analysis include which parcels would be offered for lease, which parcels would be deferred from the November 2011 lease sale, which parcels are not available for leasing, and what stipulations will be placed on the parcels that would be offered for lease.

1.1 Conformance with Applicable Land Use Plan and Other Environmental Assessments

Pursuant to 40 CFR1508.28 and 1502.21, this EA tiers to and conforms with the approved Kemmerer, Pinedale, Rawlins, and Green River RMPs and Final Environmental Impact Statements (FEIS) and to the associated Records of Decisions (ROD) for each Field Office. The impact analysis in the EISs for the affects from oil and gas development was based on and is commensurate with the Reasonably Foreseeable Development (RFD) scenario (i.e., the level of oil and gas development projected for the life of the plan based on historically and projected trends). The mitigation measures developed through those EISs reduced/minimized the anticipated impacts associated with the projected development to acceptable levels below the significance thresholds. The mitigation (i.e., stipulations and Best Management Practices (BMPs) developed through the RMP/EIS process are carried in to this EA, both through tiering and through actually application to individual parcels.

The Kemmerer, Pinedale, Rawlins, and Green River RMPs identify lands open, closed, and unavailable for leasing, and provide specific stipulations that would be attached to new leases offered in certain areas. Of the 64 parcels in the RFO, two (2) are completely unavailable for leasing based on decisions in the Rawlins RMP/ROD. Of the 4 nominated parcels in the PFO, one parcel is completely unavailable for leasing based on decisions in the Pinedale RMP/ROD. None of the parcels in the Kemmerer or Rock Springs Field Offices would be located in areas that are designated as unavailable for leasing.

<u>The following parcels are unavailable for leasing and are DELETED in whole from this sale (these parcels will not be addressed any further in this EA)</u>:

1. WY-1111-041 – 1410.76 acres within the Rawlins RMP Cow Butte/Wild Cow Wildlife Habitat Management Area (WHMA);
2. WY-1111-054 – 320.00 acres within the Rawlins RMP Upper Muddy Creek/Grizzly WHMA;
3. WY-1111-078 – 2496.59 acres within the Pinedale RMP Unavailable for Leasing Area (Trapper's Point Area of Critical Environmental Concern (ACEC).

<u>The following partial parcel falling within the Upper Muddy Creek/Grizzly WHMA is unavailable for leasing and is DELETED from this sale (this portion of parcel WY-1111-042 will not be addressed any further in this EA)</u>:

1. WY-1111-042 560.000 Acres
   T.0180N, R.0900W, 06th PM, WY
   Sec. 014 W2NE,NW,S2;

Total acreage deleted from the November 2011 lease parcel offering: 4787.35 acres.

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

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

Interdisciplinary teams from each Field Office reviewed their respective lease parcel lists for this environmental assessment. Among other resource values, individual parcels may contain threatened, endangered, candidate, and BLM sensitive species (see Section 3.0 and Appendix B). The administrative act of offering parcels and subsequent issuance of oil and gas leases is consistent with the decisions in the Kemmerer, Pinedale, Rawlins, and Green River RMPs, including the decision relating to threatened, endangered, candidate, and BLM sensitive species. Offering and subsequent issuance of oil and gas leases is also consistent with the Biological Assessment and Biological Opinion (BA/BO) for these RMPs. No further consultation with the US Fish and Wildlife Service (USFWS) is required at this stage.

Compliance with Section 106 responsibilities of the National Historic Preservation Act (NHPA) can be achieved by following the BLM Wyoming-State Historic Preservation Officer (SHPO) protocol agreement, which is authorized by the National Programmatic Agreement between BLM, the Advisory Council on Historic Preservation, and the National Conference of SHPOs, and other applicable BLM handbooks.

1.3 Federal Leasing of Fluid Minerals

Analysis as required by the National Environmental Policy Act (NEPA) of 1969, as amended (Public Law 91-90, USC 4321 *et seq*.) was conducted by Field Office resource specialists who relied on personal knowledge of the areas involved and/or reviewed existing databases and file information to determine if appropriate stipulations had been attached to specific parcels before being made available for lease.

The offering and subsequent issuance of oil and gas leases is strictly an administrative action, which, in and of itself, does not cause or directly result in any surface disturbance. The issuance of an oil and gas lease, however, does convey to the lessee the rights to occupy, explore, and extract oil and gas resources from the lease with prior approval of the Authorized Officer. These post-leasing actions can result in surface impact.

As part of the lease issuance process, nominated parcels are reviewed against the appropriate land use plan, and stipulations are attached to mitigate any 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/or drill

on the lease. The BLM cannot determine at the leasing stage whether or not a nominated parcel will actually be leased, or if it is leased, whether or not the lease would be explored or developed. 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 of an Application for Permit to Drill (APD) may be the first useful 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). In addition, the IBLA has decided that, "BLM is not required to undertake a site-specific environmental review before 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). BLM has not received any development proposals concerning the proposed lease parcels addressed in this EA. Accordingly, additional NEPA documentation would be prepared at the time an APD(s) or field development proposal is submitted. It is assumed that post-lease actions would be within the RFD analyzed in the EISs for the governing RMPs and that the impacts would also be within the thresholds of the RMPs/EISs as mitigated. This site-specific environmental documentation would provide site-specific analysis for the well pad location or locations. Additional mitigation and BMPs may be applied as conditions of approval (COA) at that time.

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

Offering, sale and issuance of leases would not be in conflict with any local, county, or state plans.

Once a parcel is sold and the lease is issued, the lessee has the right to use so much of the leased lands as is reasonably necessary to explore and drill for all of the oil and gas within the lease boundaries, subject to the stipulations attached to the lease (43 CFR 3101.1-4).

Oil and gas leases are issued for a 10-year period and continue for so long thereafter as oil or gas is produced in paying quantities. If a lessee fails to produce oil and gas, does not make annual rental payments, does not comply with the terms and conditions of the lease, or relinquishes the lease, then ownership of the minerals leased revert back to the federal government and may be leased again.

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

1.4 Scoping and Public Involvement

1.4.1 Scoping

Internal BLM scoping determined the parcels individually or collectively contain one or more of the following resource issues or concerns:

- Crucial big game winter habitat
- Greater sage-grouse leks and nesting habitat
- Greater sage-grouse key habitat areas
- Mountain plover nesting habitat
- Raptor nesting habitat
- Sensitive Species
- Water depletion affects to downstream threatened and endangered fish species
- Sensitive soils
- Slopes greater than 25 percent
- Riparian and live water habitat
- Air quality, including green house gases
- Surface and groundwater quality
- Wilderness characteristics
- Visual resource management (VRM)
- Recreation
- Socioeconomics
- Vegetation, including invasive non-native species
- Cultural and paleontological resources, including historic trails
- Leasable coal resources
- Proximity to residences
- Livestock grazing
- Watershed and hydrology
- Threatened/Endangered Species

1.4.2 Public Participation

Public participation was initiated when this EA was entered into the Rawlins Field Office NEPA tracking database on the RFO website in March 2011. A news release was issued on April 19, 2011 notifying the public that the draft EA was posted on the BLM Wyoming website for a 30 day public comment period. As required by BLM leasing policy, where parcels are split estate, a notification letter soliciting EA review and comments were sent to the appropriate surface owner based on the surface owner information provided by the party submitting the Expressions of Interest (EOI).

PROPOSED ACTION AND ALTERNATIVES

2.0 Alternatives Including the Proposed Action

One hundred twenty-five (125) lease parcels (179,514.5 acres) were originally nominated and proposed for inclusion in the November 2011 Notice of Competitive Oil and Gas Lease Sale. Three (3) parcels and portions of one (1) additional parcel fall within RMP designated areas that are unavailable for leasing and are therefore not analyzed under any alternative (see Section 1.1).

2.1 Alternative A -- No Action

Under the No Action Alternative BLM Wyoming would not offer any of the 122 parcels available for lease at the November 2011 lease sale. In the case of a lease sale, this would mean that the EOIs to lease (parcel nomination) would be denied or rejected and all 122 available lease parcels would be withdrawn from lease sale. It is not expected that demand for energy, including

oil and gas, will go down; choosing the No Action alternative would not prevent future leasing in these areas consistent with land use planning decisions and subject to appropriate stipulations, identified in the respective Kemmerer, Pinedale, Rawlins, and Green River RMPs. Therefore, it is fully anticipated that these parcels, excluding those that fall within areas designated as unavailable for leasing, would be nominated and offered at a future date. While future leases may contain more restrictive lease terms, it is reasonable to assume that a substantial portion of the development possible under current planning decisions would also be possible under future leases.

2.2 Alternative B -- Proposed Action

Of the 122 available parcels nominated that are available for leasing under the referenced RMPs, BLM Wyoming would offer 80 whole parcels and portions of 10 additional parcels for lease at the November 2011 Oil and Gas Lease Sale. The offered parcels contain 105,754.46 acres of federal minerals that are available under the Kemmerer, Pinedale, Rawlins, and Green River RMPs/RODs for oil and gas leasing. Standard terms and conditions/stipulations would apply. Lease stipulations (as required by 43CFR 3131.3) were added to each parcel as identified by KFO, PFO, RFO, and RSFO to address site specific concerns or new information not identified in the land use planning process. Refer to Appendix B for a list of the parcels and proposed stipulations attached to each.

Additionally, 24 whole parcels and 10 partial parcels (54,480.08 acres) falling within sage grouse key habitat areas meeting the manageability criteria in BLM Wyoming Instruction Memorandum WY-2010-013; and/or needing field inventory in accordance with FLPMA requirements to determine if they meet the lands with wilderness characteristics criteria; and/or requiring Native American consultation would be deferred from the November 2011 oil and gas lease sale under this alternative (see Appendix A) pending completion of the Greater sage-grouse RMP amendment, the field review for wilderness characteristics, and/or completion of the Native American consultation. Eight (8) additional parcels containing (14,490.61 acres) will be deferred due to administrative deficiencies with the Expression of Interest to include in the November 2011 Lease Sale. In total, 32 whole and 10 partial parcels (68,970.69 acres) would be deferred under this Alternative.

2.3 Alternative C-Maximum Parcels Offering

Under Alternative C, BLM Wyoming would offer all the parcels under Alternative B, plus it would offer all parcels deferred under Alternative B. This alternative would make approximately 174,725.15 acres from 122 parcels available for leasing. All other aspects of this alternative are the same as the proposed action.

2.4 Alternatives Considered But Not Analyzed in Detail

An alternative was considered that would offer all of the parcels that are administratively available for leasing with a no surface occupancy stipulation. This alternative was deleted from detailed analysis because it does not meet the purpose and need of providing areas for the potential exploration and development of additional oil and gas resources to help meet the nation's current and expanding need for energy sources. Additionally, it prohibits surface occupancy for oil and gas development; whereas other non-oil & gas occupancy may not be similarly constrained. Further, it unnecessarily constrains oil and gas occupancy in areas where the Kemmerer, Pinedale, Rawlins, and Green River RMPs have determined that less restrictive stipulations would adequately mitigate the anticipated impact.

No other alternatives to the proposed action were identified that would meet the purpose and need of the proposed action.

AFFECTED ENVIRONMENT

3.0 DESCRIPTION OF AFFECTED ENVIRONMENT

This section describes the current environment and present conditions of various resources that would be affected by the project. Aspects of the affected environment described in this section focus on the relevant major resources or issues. Only those aspects of the affected environment that are potentially impacted are described in detail. The following are not present on any of the parcels or partial parcels available for offer: Prime or Unique Farmlands. All parcels were reviewed against the Master Leasing Plan (MLP) requirements in BLM Washington Office (WO) IM-2010-117. None of the parcels were determined to be in an area that met the criteria; see Appendix E for more information.

3.1 SITE VISITS:

From March 16 through 22, the RFO Interdisciplinary Parcel Review Team (IDPRT) visited parcels WY-1111-001-009, 014-019, 029, 032-036, 037, 038, 043-048, 050-052, 056 and 057. The sites were partially to completely snow covered but were accessible. The site visits revealed no resource values or concerns other than those already identified through their review of the parcels via the RFO Geographic Information System (GIS) data base and National Agriculture Imagery Program (NAIP 2009) digital aerial imagery. The IDPRT was unable to access parcels WY-1111-010, 013, 020, 026, 039, 042, 048, 049, 053, and 055 due to impassable and excessive snow conditions. Parcels WY-1111-041 and 054 are not available for lease; therefore were not visited, nor were parcels WY-1111-021-025, 027, 028, 030, 031, 058-061, and 063-065 that are recommended for deferral under Alternative B.

From March 16 through 22, the Rock Springs IDPRT conducted site visits for parcels WY-1111-062, 066, 067, 077, 089. Parcel 088 could not be accessed due to excessive snow depths and impassable access roads, but was viewed from State Highway 414 approximately one half mile west of the parcel. The site visits revealed no resource values or concerns other than those already identified through their review of the parcels via the RSFO GIS data base and NAIP digital aerial imagery. Parcels 079 and 082 could not be accessed due to deep snow conditions and unplowed roads. These parcels could not be viewed from close enough distance to evaluate the surface resource condition. Site verification for these parcels was accomplished through 2009 NAIP digital aerial photography, as was a closer observation of parcel WY-1111-088. Site visits were not conducted for the parcels that would be deferred under Alternative B. A site visit for parcel 068 was conducted as part of a lands with wilderness characteristics review on June 29. The visit determined that the portion of parcel 068 west of County Road 34 is in an area that does not contain lands with wilderness characteristics (LWC); whereas the portion east of County Road 34 falls within an area determined to have LWC. The visit revealed no other resources values beyond those identified through the GIS data base and digital imagery review.

On March 24, the PFO IDPRT conducted site visits for parcels WY-1111-074, 075, and 076. The parcels were accessible but were snow covered. The site visits revealed no resource values or concerns other than those already identified through their review of the parcels via the PFO

GIS data base and NAIP digital aerial imagery. Parcel 075 is recommended for deferral under Alternative B, but was still visited because of its proximity to parcels 074 and 076.

From March 10 through 15, the KFO IDPRT visited parcels WY-1111-089, 093, 094, 095, 103, 104, 108, 109, 110, 111, 112, 114, 115, and 122. Additionally, they were able to view parcel 088 from about ½ miles, parcel 090 from about 1.5 miles, parcels 96 and 124 from about ¼ mile, and parcel 113 from about ¾ mile. Impassable roads due to excess snow depths and or muddy conditions prevented closer observations. Impassable roads and excess snow depths also prevented the IDT from reaching or observing parcels WY-1111-091, 092, 097, 098, 099, 100, 101, 105, 106, 107, 116, 117, 118, 119, 120, 121, 123, and 125. Site verification for these parcels was accomplished via 2009 NAIP digital aerial photography, as was closer observation of parcels WY-1111-088, 090, 096, 113, 102, 123, and 124. Other than parcel 122, where a previously unknown bald eagle nest was observed, the IDPRT was not able to determine any resource values or concerns other than those already identified through their review of the parcels through the KFO GIS database and NAIP digital aerial imagery.

3.2 RESOURCE VALUES BY PARCEL:

WY-1111-001 and WY-1111-002 (Both parcels are in RFO and would be available to be offered for lease under Alternatives B and C): The parcels are on split estate (private surface/federal minerals). The Rawlins RMP does not designate Visual Resource Management (VRM) classifications for non-federal lands; hence the private lands in both parcels have no VRM designation. The parcels contain riparian habitat. Parcel 001has slopes greater than 25 percent. The slopes within parcel 002 are less than 10 percent. The parcels are located in areas with the potential to provide habitat for Wyoming pocket gopher and mountain plover. The parcels also potentially provide habitat for the Colorado butterfly plant and Ute's ladies-tresses. The riparian area provides potential habitat for a variety of amphibian and/or reptilian species. Neither parcel falls within a Greater sage-grouse key habitat area, nor do they fall within any BLM grazing allotments. Due to the private surface, the parcels have the potential to contain occupied dwellings within ¼ mile. The vegetation type on the parcel is a combination of grasslands and riparian dominated by grasses, forbs, sedges in the lower lying areas and agricultural croplands. The parcels lie within the Platte River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations. The soils are lower-elevation upland soils with a relatively thick, dark organic based surface and A horizons and with a 15 to 17 inch annual precipitation average. They are moderately to highly productive and are generally stable, but do have a low to moderate erosion potential. The parcels also contain riparian soils that are moderately deep, productive, and have a low to moderate erosion potential.

WY-1111-003 (The entire parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The parcel is a combination of split estate lands (private surface/federal minerals) and federal lands administered by the BLM. The Rawlins RMP does not designate VRM classifications for non-federal lands; hence the private lands in parcel WY-1111-003 have no VRM designation. The federal lands have VRM Class II and III designations. The parcel provides crucial big game winter, Greater sage-grouse winter concentration, Greater sage-grouse breeding and nesting, and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher, Beaver Rim phlox, and Laramie false sagebrush. The riparian area provides potential habitat for a variety of amphibian and/or reptilian species. A portion of the

parcel falls within a Greater sage-grouse key habitat area. The parcel is located within the Home Ranch and Dana Meadows South livestock grazing allotments. Due to the private surface, the parcel has the potential to have occupied dwellings on or within ¼ mile. The parcel also has the potential to contain sensitive cultural resource sites and contains a segment of the Overland Trail. The parcel is within sagebrush dominated shrublands with a variety of forbs and grasses. The parcel lies within the Platte River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations. The parcel contains riparian habitat and has slopes greater than 25 percent. The soils in parcel 003 are mid- to high-elevation upland soils that are generally shallow, with a depth to bedrock of less than 20 inches occurring in areas. They have a thin organic based surface horizon and are in a10 to 19 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially on slopes greater than 25 percent. The parcel also contains some riparian and forested soils that are moderately deep, productive, and have a low to moderate erosion potential. The private lands within parcel 003 that owned the Elk Mountain Ranch (Iron Bar LLC) are constrained by a Conservation Easement granted to the Nature Conservancy.

WY-1111-004, WY-1111-005, and WY-1111-006 (All three parcels are in RFO and would be available to be offered for lease under Alternatives B and C): The parcels are on BLM administered surface and mineral estates. The parcels have VRM Class III and IV classifications. Parcels 004, 006, and a portion of 005 are within a Greater sage-grouse key habitat area. All three parcels provide crucial big game winter range, Greater sage-grouse winter concentration, Greater sage-grouse breeding and nesting, and raptor nesting habitat. The parcels also potentially provide habitat for Wyoming pocket gopher and Beaver Rim phlox. The parcels contain riparian habitat and have slopes greater than 25 percent. The riparian area provides potential habitat for a variety of amphibian and/or reptilian species. There are no known occupied dwellings within ¼ mile of the parcel. The parcels lie within the Platte River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcels also have the potential to contain sensitive cultural resource sites and are within the Dana Meadows South livestock grazing allotment. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations. The soils in all three parcels are mid-elevation upland soils that are generally shallow, with a depth to bedrock of less than 20 inches occurring in areas. They have a thin organic based surface horizon and are in a 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially on slopes greater than 25 percent.

WY-1111-007 (The entire parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The parcel is a combination of split estate lands (private surface/federal minerals) and federal lands administered by the BLM. The Rawlins RMP does not designate VRM classifications for non-federal lands; hence the private lands in parcel WY-1111-007 have no VRM designation. The federal lands have a VRM Class III designation. Portions of parcel 007 fall within a Greater sage-grouse key habitat area. The parcel provides crucial big game winter, Greater sage-grouse winter concentration, Greater sage-grouse breeding and nesting, and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher and Beaver Rim phlox. The riparian area provides potential habitat for a variety of amphibian

and/or reptilian species. The parcel is located within the Dana Meadows South livestock grazing allotment. Due to the private surface, the parcel has the potential to have occupied dwellings on or within ¼ mile. The parcel falls within sagebrush dominated shrublands with a variety of forbs and grasses. The parcel also has the potential to contain sensitive cultural resource sites. The parcel lies within the Platte River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations. The parcel contains riparian habitat and slopes greater than 25 percent. The soils in parcel 007 are mid-elevation upland soils that are generally shallow, with a depth to bedrock of less than 20 inches occurring in areas. They have a thin organic based surface horizon and are in a 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially on slopes greater than 25 percent. The private lands within parcel 007 that owned the Elk Mountain Ranch (Iron Bar LLC) are constrained by a Conservation Easement granted to the Nature Conservancy.

WY-1111-008 (The entire parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The entire parcel is federal surface and mineral estates. The parcel has VRM Class III and IV classifications. Parcel 008 falls within a Greater sage-grouse key habitat area. The parcel provides crucial big game winter, Greater sage-grouse breeding and nesting, and raptor nesting habitat. The parcel also potentially provides habitat for black-footed ferret, white-tailed prairie dog, Wyoming pocket gopher, mountain plover, and Cedar Rim thistle. The riparian area provides potential habitat for a variety of amphibian and/or reptilian species. There are no known occupied dwellings within ¼ mile of the parcel. The parcel lies within the Platte River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel falls within the Shirley Mountain and the T.E. Ranch livestock grazing allotments. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations. The parcel contains riparian habitat, but does not contain slopes greater than 25 percent. The soils in parcel 008 are mid-elevation upland soils that are generally shallow, with a depth to bedrock of less than 20 inches occurring in areas. They have a thin organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential.

WY-1111-009 (The entire parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The parcel is a combination of split estate lands (private surface/federal minerals) and federal lands administered by the BLM. The Rawlins RMP does not designate VRM classifications for non-federal lands; hence the private lands in parcel WY-1111-009 have no VRM designation. The federal lands have a VRM Class III designation. The parcel contains riparian habitat, and contains slopes greater than 25 percent. Parcel 009 falls within a sage-grouse core area. The parcel provides sage grouse and raptor nesting habitat. The parcel also potentially provides habitat for black-footed ferret, Wyoming pocket gopher, Rocky Mountain twinpod, and Beaver Rim phlox. The riparian area provides potential habitat for a variety of amphibian and/or reptilian species. Due to the private surface, the parcel has the potential to have occupied dwellings on or within ¼ mile. The parcel lies within the Platte River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species

occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel falls within the Schneider Ridge livestock grazing allotment. Refer to Appendices B, C, and D for sage-grouse core area, wilderness characteristics, and MLP determinations. The soils in parcel 009 are mid-elevation upland soils that are generally shallow, with a depth to bedrock of less than 20 inches occurring in areas. They have a thin organic based surface horizon and a 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially on slopes greater than 25 percent.

WY-1111-010 and WY-1111-011 (Both parcels are in RFO and would be available to be offered for lease under Alternatives B and C): The entire parcels are federal surface and mineral estates. The parcel has VRM Class II and IV classifications. Parcel 010 contains riparian habitat, but does not contain slopes greater than 25 percent. Both parcels are in a Greater sage-grouse key habitat area. The parcel provides Greater sage-grouse winter concentration, Greater sage-grouse breeding and nesting, and raptor nesting habitat. The parcels potentially provide habitat for black-footed ferret, Wyoming pocket gopher, mountain plover, and persistent sepal yellowcress. The riparian area in parcel 010 provides potential habitat for a variety of amphibian and/or reptilian species. There are no known occupied dwellings within ¼ mile of the parcel. The parcels lie within the Platte River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcels fall within the Quealy Block livestock grazing allotment. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations. Parcel 011 does not contain riparian habitat or slopes greater than 25 percent. The soils are mid-elevation upland soils that are generally shallow, with a depth to bedrock of less than 20 inches occurring in areas. They have a thin organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential.

WY-1111-012 (The entire parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The entire parcel is split estate (private surface/federal minerals). The Rawlins RMP does not designate VRM classifications for non-federal lands; hence the private lands in parcel WY-1111-012 have no VRM designation. Portions of parcel 012 fall within a Greater sage-grouse key habitat area. The parcel provides Greater sage-grouse winter concentration, Greater sage-grouse nesting, and raptor nesting habitat. The parcel also potentially provides habitat for black-footed ferret, Wyoming pocket gopher, mountain plover, persistent sepal yellowcress, meadow pussytoes, and Beaver Rim phlox. The riparian area provides potential habitat for a variety of amphibian and/or reptilian species. Due to the private surface, the parcel has the potential to have occupied dwellings within ¼ mile. The parcel lies within the Platte River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel also has the potential to contain sensitive cultural resource sites. The parcel falls within the Fort Steele Breaks livestock grazing allotment. The parcel contains riparian habitat, and contains slopes greater than 25 percent. The soils in parcel 012 are mid-elevation upland soils that are generally shallow, with a depth to bedrock of less than 20 inches occurring in areas. They have a thin organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are

moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially on slopes greater than 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-013 (The entire parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The entire parcel is within Bureau of Reclamation (BOR) surface and BLM administered mineral estate. The parcel has a VRM Class II classification. Parcel 013 falls within a Greater sage-grouse key habitat area. The parcel provides Greater sage-grouse and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher and persistent sepal yellowcress. The riparian area provides potential habitat for a variety of amphibian and/or reptilian species. There are no known occupied dwellings within ¼ mile of the parcel. The parcel lies within the Platte River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel falls within the North Walcott livestock grazing allotment. The parcel contains riparian habitat, and contains slopes greater than 25 percent. The soils in parcel 013 are mid-elevation upland soils that are generally shallow, with a depth to bedrock of less than 20 inches occurring in areas. They have a thin organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially on slopes greater than 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations. The parcel contains a small segment of Seminoe Reservoir.

WY-1111-014 and WY-1111-015 (Both parcels are in RFO and would be available to be offered for lease under Alternatives B and C): The parcels are BLM administered surface and mineral estates. The parcels have a VRM Class II classification. Both parcels are in a Greater sage-grouse key habitat area. The parcels provide Greater sage-grouse winter concentration, Greater sage-grouse nesting, and raptor nesting habitat and potentially provide habitat for black-footed ferret, white-tailed prairie dog, Wyoming pocket gopher, mountain plover, and persistent sepal yellowcress. Riparian areas may potential habitat for a variety of amphibian and/or reptilian species. There are no known occupied dwellings within ¼ mile of the parcel. The parcels are within the Platte River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. Parcel 014 falls within the Quealy Block and Seminoe livestock grazing allotments. Parcel 015 is solely within the Seminoe allotment. The parcels contain riparian habitat and slopes greater than 25 percent. The soils are mid-elevation upland soils that are generally shallow, with a depth to bedrock of less than 20 inches occurring in areas. They have a thin organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially on slopes greater than 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-016 (The parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The parcel is a combination of split estate lands (private surface/federal minerals) and federal lands administered by the BLM. The federal lands have a VRM Class III designation. Parcel 016 does not fall within a Greater sage-grouse key habitat area, but does fall

within mapped Greater sage-grouse habitat. The parcel provides Greater sage-grouse and raptor nesting habitat. The parcel also potentially provides habitat for white-tailed prairie dog, Wyoming pocket gopher, mountain plover, and persistent sepal yellowcress. The parcel has an occupied dwelling within ¼ mile. The parcel lies within the Platte River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel also has the potential to contain sensitive cultural resource sites. The parcel falls within the East Sinclair and Pine Grove/Bolton livestock grazing allotments. The parcel does not contain riparian habitat, nor does it contain slopes greater than 25 percent. The soils are mid-elevation upland soils that are generally shallow, with a depth to bedrock of less than 20 inches occurring in areas. They have a thin organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-017 (The parcel is in RFO and would available to be offered for lease under Alternatives B and C): The majority of the parcel is BLM administered surface and mineral estates but has some split estate (private surface/federal minerals). The federal lands have a VRM Class II classification. Parcel 017 falls within a Greater sage-grouse key habitat area and mapped Greater sage-grouse habitat and provides Greater sage-grouse breeding and nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher, boreal toad, Laramie false sage, Rocky Mountain twinpod, and Beaver Rim phlox. Riparian areas may provide habitat for a variety of amphibian and/or reptilian species. Due to the private surface within and around the parcel, there is a potential to have occupied dwellings within ¼ mile. The parcel lies within the Platte River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel is within the Seminoe grazing allotment. The parcel contains riparian habitat, and slopes greater than 25 percent. The soils are mid-elevation stabilized sand dunes that are moderate to deep, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially in blowout areas that are actively moving. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-018 (The parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The majority of the parcel is BLM administered surface and mineral estates but has some split estate (private surface/federal minerals). The federal lands have a combination of VRM Class II and III classifications. Parcel 018 does not fall within Greater sage-grouse key habitat area but does fall in mapped Greater sage-grouse habitat and provide Greater sage-grouse breeding and nesting habitat. The parcel contains crucial big game winter range, as well as spring, summer, and fall habitat for multiple big game species. The parcel also potentially provides habitat for Wyoming pocket gopher, boreal toad, Laramie false sage, and blowout penstemon. Riparian areas may provide habitat for a variety of amphibian and/or reptilian species. Due to the private surface within and around the parcel, there is a potential to have occupied dwellings within ¼ mile. The parcel lies within the Platte River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel is within the Seminoe grazing allotment. The predominant

vegetation type is sagebrush dominated shrublands with a variety of forbs, grasses, conifer stands, aspen stands, and riparian habitat. The parcel contains riparian habitat and slopes greater than 25 percent. The soils are mid-elevation stabilized sand dunes that are moderate to deep, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially in blowout areas that are actively moving. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-019 (The parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The parcel is a combination of split estate lands (private surface/federal minerals) and federal lands administered by the BLM. The federal lands have a VRM Class III designation. Parcel 019 does not fall within a Greater sage-grouse key habitat area, but a portion of the parcel falls within mapped Greater sage-grouse habitat. The parcel provides crucial big game winter, Greater sage-grouse nesting, and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher, mountain plover, persistent sepal yellowcress, and Beaver Rim phlox. The parcel has an occupied dwelling within ¼ mile. The parcel lies within the Platte River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel also has the potential to contain sensitive cultural resource sites. The parcel falls within the Haystack livestock grazing allotment. The parcel does not contain riparian habitat or slopes greater than 25 percent. The soils are mid-elevation upland soils that are generally shallow, with a depth to bedrock of less than 20 inches occurring in areas. They have a thin organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-020 (Portions of the parcel is available to be offered for lease under Alternative B. The entire parcel is in RFO and is available in Alternative C): The majority of the parcel is BLM administered surface and mineral estate but has some split estate (private surface/federal minerals). The federal lands have a combination of VRM Class II and III classifications. The majority of Parcel 020 falls within a Greater sage-grouse key habitat area and mapped Greater sage-grouse habitat. The parcel also potentially provides habitat for Wyoming pocket gopher, boreal toad, Greater sage-grouse breeding and nesting habitat, and blowout penstemon. The riparian area provides potential habitat for a variety of amphibian and/or reptilian species. Due to the private surface within and around the parcel, there is a potential to have occupied dwellings on or within ¼ mile. The parcel lies within the Great Divide Closed Basin and Platte River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel is in the Stone grazing allotment. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs, grasses, conifer stands, and aspen stands. The parcel contains riparian habitat and slopes greater than 25 percent. The soils are mid-elevation stabilized sand dunes that are moderate to deep, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential,

especially in blowout areas that are actively moving. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-021 (The parcel is in RFO and would be deferred for lease under Alternative B, but would be available in Alternative C): The parcel is a combination of split estate lands (private surface/federal minerals) and federal lands administered by the BLM. The federal lands have a VRM Class III designation. Parcel 021 falls within a Greater sage-grouse key habitat area. The parcel provides crucial big game winter, Greater sage-grouse breeding and nesting, and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher and blowout penstemon, due to the fact that portions of the parcel fall within the blowout penstemon ACEC. Due to the private surface, the parcel has the potential to have occupied dwellings within ¼ mile. The parcel lies within the Platte River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel falls within the Haystack livestock grazing allotment. The parcel does not contain riparian habitat or slopes greater than 25 percent. The soils are mid-elevation stabilized sand dunes that are moderate to deep, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially in blowout areas that are actively moving. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-022 (The entire parcel is in RFO and would be deferred for lease under Alternative B, but would be available in Alternative C): The entire parcel is BLM administered surface and mineral estates. The federal lands have VRM Class II and III designations. Parcel 022 falls within a Greater sage-grouse key habitat area. The parcel provides crucial big game winter and Greater sage-grouse nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher, Laramie false sagebrush, and Rocky Mountain twinpod. There are no known occupied dwellings within ¼ mile of the parcel. The parcel lies within the Platte River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel falls within the Seminoe and Stone livestock grazing allotments. The parcel does not contain riparian habitat, but it does contain slopes greater than 25 percent. The soils are mid-elevation stabilized sand dunes that are moderate to deep, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially in blowout areas that are actively moving. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-023 and WY-1111-024 (Both parcels are in RFO and would be deferred for lease under Alternative B, but would be available in Alternative C): The parcels are a combination of split estate lands (private surface/federal minerals) and federal lands administered by the BLM. The federal lands have a combination of VRM Class II and III designations. The parcels are in a Greater sage-grouse key habitat area. The parcels provide crucial big game winter, Greater sage-grouse breeding and nesting habitat, and raptor nesting habitat and potentially provide habitat for

Wyoming pocket gopher. Parcel 023 potentially contains habitat for Beaver Rim phlox. Due to the private surface, the parcels have the potential to have occupied dwellings within ¼ mile. They lie within the Platte River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcels fall within the Seminoe livestock grazing allotment. Parcel 023 falls within part of the Stone allotment. The parcels do not contain riparian habitat, but do contain slopes greater than 25 percent. The soils are mid-elevation stabilized sand dunes that are moderate to deep, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially in blowout areas that are actively moving. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-025 (The parcel is in RFO and would be deferred for lease under Alternatives B, but would be available in Alternative C): The entire parcel is BLM administered surface and mineral estates. The federal lands have a combination of VRM Class II and III designations. Parcel 025 falls within a Greater sage-grouse key habitat area. The parcel provides crucial big game winter, Greater sage-grouse, and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher and Beaver Rim phlox. There are no known occupied dwellings within ¼ mile of the parcel. The parcel lies within the Platte River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel falls within the Seminoe and Stone livestock grazing allotments. The parcel does not contain riparian habitat, but it does contain slopes greater than 25 percent. The soils are mid-elevation stabilized sand dunes that are moderate to deep, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially in blowout areas that are actively moving. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-026 (A portion of the parcel is available to be offered for lease a under Alternative B. The entire parcel is in RFO and would be available in Alternative C): The majority of the parcel is BLM administered surface and mineral estates but has some split estate (private surface/federal minerals). The federal lands have a combination of VRM Class II and III classification. Parcel 026 falls within a Greater sage-grouse key habitat area and mapped Greater sage-grouse habitat. The parcel also potentially provides habitat for Wyoming pocket gopher, Greater sage-grouse breeding and nesting habitat, Rocky Mountain twinpod, and blowout penstemon, due to the fact that portions of the parcel fall within the blowout penstemon ACEC. The riparian area provides potential habitat for a variety of amphibian and/or reptilian species. Due to the private surface within and around the parcel, there is a potential to have occupied dwellings within ¼ mile. The parcel lies within the Platte River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel would be located within the Stone grazing allotment. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs, grasses, conifer stands, and aspen stands. The parcel contains riparian habitat and slopes greater than 25

percent. The soils are mid-elevation stabilized sand dunes that are moderate to deep, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially in blowout areas that are actively moving. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-027 and WY-1111-028 (Both parcels are in RFO and would be deferred for lease under Alternative B, but would be available in Alternative C): The parcels are BLM administered surface and mineral estates. The federal lands have VRM Class III and III designations. They are in a Greater sage-grouse key habitat area, mapped Greater sage-grouse habitat, and provide Greater sage-grouse breeding and nesting habitat, and potential habitat for Wyoming pocket gopher. There are no known occupied dwellings within ¼ mile of the parcels. The parcels lie within the Great Divide Closed Basin watershed. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcels fall within the Stone livestock grazing allotment. The parcels contain riparian habitat and slopes greater than 25 percent. The soils are mid-elevation stabilized sand dunes that are moderate to deep, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially in blowout areas that are actively moving. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-029 (The parcel is in RFO and would be partially deferred for lease under Alternative B, but would be available in Alternative C): The entire parcel is BLM administered surface and mineral estates. The parcel has a VRM Class III designation. Parcel 029 falls within a Greater sage-grouse key habitat area and mapped Greater sage-grouse habitat. The parcel provides crucial big game winter range, Greater sage-grouse breeding and nesting habitat, and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher, boreal toad, and Ferruginous hawk. There are no known occupied dwellings within ¼ mile of the parcel. The parcel lies within the Great Divide Closed Basin watershed. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel falls within the Stone livestock grazing allotment. The parcel contains riparian habitat, but it does contain slopes greater than 25 percent. The soils in parcel 029 are mid-elevation stabilized sand dunes that are moderate to deep, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially in blowout areas that are actively moving. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-030 (The entire parcel is in RFO and would be deferred for lease under Alternative B, but would be available in Alternative C): The parcel is a combination of split estate lands (private surface/federal minerals) and federal lands administered by the BLM. The federal lands have a VRM Class III designation. Parcel 030 falls within a Greater sage-grouse key habitat area provides Greater sage-grouse nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher. Due to the private surface, the parcel has the potential to have

occupied dwellings within ¼ mile. The parcel lies within the Great Divide Closed Basin watershed. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel falls within the Stone and Ferris Mountain livestock grazing allotments. The parcel does not contain riparian habitat, but it does contain slopes greater than 25 percent. The soils are mid-elevation stabilized sand dunes that are moderate to deep, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially in blowout areas that are actively moving. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-031 and WY-1111-032 (Both parcels are in RFO. Parcel 031 would be deferred for lease under Alternative B, but would be available in Alternative C. Parcel 032 would be available in Alternatives B and C): The parcels are BLM administered surface and mineral estates and have a VRM Class III designation. They are in a Greater sage-grouse key habitat area and provide crucial big game winter and Greater sage-grouse breeding and nesting habitat. The parcels potentially provide habitat for Wyoming pocket gopher. Parcel 031 also potentially provides habitat for mountain plover. There are no known occupied dwellings within ¼ mile of the parcel. The parcels lie within the Great Divide Closed Basin watershed. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcels fall within the Ferris Mountain livestock grazing allotment. Parcel 031 also occupies part of the Stone allotment. The parcels do not contain riparian habitat or slopes greater than 25 percent. The soils are mid-elevation stabilized sand dunes that are moderate to deep, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially in blowout areas that are actively moving. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-033, WY-1111-034, and WY-1111-035 (All three parcels are in RFO would be available to be offered for lease under Alternative C. Parcel 034, 035, and part of 033 would be available in Alternative B): The parcels are BLM administered surface and mineral estates. They have a VRM Class III classification. Portions of all three parcels are in a Greater sage-grouse key habitat area. They provide crucial big game winter range, Greater sage-grouse breeding and nesting habitat, mountain plover nesting habitat, and potentially provide habitat for white-tailed prairie dog, persistent sepal yellowcress, and Wyoming pocket gopher. The riparian areas may provide habitat for a variety of amphibian and/or reptilian species. The parcels are within the Great Divide Closed Basin watershed and are located within Stone grazing allotment. Parcel 034 would also occupy part of the Ferris Mountain allotment. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcels do not contain slopes greater than 25 percent. The soils are mid-elevation stabilized sand dunes that are moderate to deep, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and a 10 to 14 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially in blowout areas that are actively moving. Parcel 035 also contains mid-elevation basin soils that are generally very shallow with a depth to bedrock of less than 20 inches occurring in areas, they have a very thin organic based surface horizon and are in the 5 to 9 inch precipitation zone. Soil productivity is low and barren areas do occur. These

soils have a moderate or greater erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-036 (The parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The parcel is a combination of split estate lands (private surface/federal minerals) and federal lands administered by the BLM. The federal lands have VRM Class II and III designations. Parcel 036 falls within a Greater sage-grouse key habitat area and mapped Greater sage-grouse habitat. The parcel provides crucial big game winter, Greater sage-grouse breeding and nesting habitat, and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher and meadow pussytoes. Due to the private surface, the parcel has the potential to have occupied dwellings within ¼ mile. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel falls within the Coal Bank Draw, Reader, Short, and Reader Basin Pasture livestock grazing allotments. The parcel does not contain riparian habitat, but it does contain slopes greater than 25 percent. The soils are mid- to high-elevation upland soils that are generally shallow, with a depth to bedrock of less than 20 inches occurring in areas. They have a thin organic based surface horizon and are in the 15 to 19 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential, especially on slopes greater than 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-037 (The parcel is in RFO and is available to be offered for lease under Alternatives B and C): The parcel is a combination of split estate lands (private surface/federal minerals) and federal lands administered by the BLM. The federal lands have a VRM Class II designation. Parcel 037 falls within a Greater sage-grouse key habitat area and mapped Greater sage-grouse habitat. The parcel provides crucial big game winter, Greater sage-grouse breeding and nesting habitat, and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher and Laramie false sagebrush. Due to the private surface, the parcel has the potential to have occupied dwellings within ¼ mile. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel falls within the Morgan Boyer Subunit and Walters Homestead livestock grazing allotments. The parcel does not contain riparian habitat, nor does it contain slopes greater than 25 percent. The soils are high-elevation upland soils that are moderate to deep, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 15 to 19 inch precipitation zone. They are generally productive and are generally stable but do have areas with moderate or greater erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-038 (The parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The entire parcel is BLM administered surface and mineral estates. The federal lands have a VRM Class II designation. Parcel 038 falls within a Greater sage-grouse key habitat area with mapped Greater sage-grouse habitat. The parcel provides crucial big game winter, Greater sage-grouse breeding and nesting habitat, and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher, white-tailed prairie dog, and

Laramie false sagebrush. There is an occupied dwelling within ¼ mile of the parcel. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel falls within the Big Gulch and Dolan livestock grazing allotments. . The parcel contains riparian habitat and slopes greater than 25 percent. The soils are high-elevation upland soils that are moderate to deep, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 15 to 19 inch precipitation zone. They are generally productive and are generally stable but do have areas with moderate or greater erosion potential, especially on slopes greater than 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations

WY-1111-039 (The parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The parcel is a combination of split estate lands (private surface/federal minerals) and federal lands administered by the BLM. The federal lands have a VRM Class III designation. Parcel 039 falls within a Greater sage-grouse key habitat area with mapped Greater sage-grouse habitat. The parcel provides crucial big game winter, Greater sage-grouse nesting and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher, Laramie false sagebrush, Beaver Rim phlox, and meadow pussytoes. Due to the private surface, the parcel has the potential to have occupied dwellings on or within ¼ mile. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel falls within the West Brown's Hill and West Loco livestock grazing allotments. The parcel contains riparian habitat and slopes greater than 25 percent. The soils are high-elevation upland soils that are moderate to deep, with a depth to bedrock greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 15 to 19 inch precipitation zone. They are generally productive and stable but do have areas with moderate or greater erosion potential, especially on slopes greater than 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-040 (The parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The entire parcel is BOR administered surface and BLM mineral estate. The federal lands have VRM Class II and III designations. Parcel 040 falls within a Greater sage-grouse key habitat area with mapped Greater sage-grouse habitat. The parcel provides Greater sage-grouse and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher and Beaver Rim phlox. There are no known occupied dwellings within ¼ mile of the parcel. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel falls within the Standard and McCary livestock grazing allotments. The parcel contains riparian habitat and slopes greater than 25 percent. The soils are high-elevation upland soils that are moderate to deep, with a depth to bedrock greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 15 to 19 inch precipitation zone. They are generally productive and stable but do have areas with moderate or greater erosion potential, especially on slopes greater than 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-041 (The entire parcel is not available for oil and gas leasing):

WY-1111-042 (The parcel is in RFO. A portion of the parcel is not available for lease under Alternative B or C. The remainder of the parcel would be available in both alternatives): The parcel is BLM administered surface and mineral estates. The federal lands have a VRM Class III designation. Parcel 042 falls within a Greater sage-grouse key habitat area with mapped Greater sage-grouse habitat. The parcel provides crucial big game winter and migration habitat as it is in the Jep Canyon Wildlife Habitat Management Area (WHMA). The parcel also provides Greater sage-grouse and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher and Beaver Rim phlox. There are no known occupied dwellings within ¼ mile of the parcel. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel also has the potential to contain sensitive cultural resource sites. The parcel falls within the Fillmore livestock grazing allotment. The parcel contains riparian habitat and slopes greater than 25 percent. The soils are mid- to high-elevation upland soils that vary in depth, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 15 to 19 inch precipitation zone. They are moderately productive and stable but do have areas with moderate or greater erosion potential, especially on slopes greater than 25 percent. The parcel is within the viewshed for the Baggs to Rawlins Stage Road. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-043 (The parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The entire parcel is BLM administered surface and mineral estates. The parcel has a VRM Class III classification. Parcel 043 falls within a Greater sage-grouse key habitat area and mapped Greater sage-grouse habitat. The parcel provides crucial big game winter range, raptor nesting habitat, Greater sage-grouse breeding and nesting habitat, and mountain plover nesting habitat. The parcel also potentially provides habitat for white-tailed prairie dog, black-footed ferret, persistent sepal yellowcress, Cedar Rim thistle, and Wyoming pocket gopher. The parcel also has the potential to contain sensitive cultural resource sites. The riparian areas provide potential habitat for a variety of amphibian and/or reptilian species. Due to the private surface around the parcel, there is a potential to have occupied dwellings within ¼ mile. The parcel lies within the Great Divide Closed Basin watershed. The parcel is the Separation Rim grazing allotment. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel contains slopes greater than 25 percent. The soils are mid-elevation basin soils that are generally very shallow, with a depth to bedrock of less than 20 inches occurring in areas, they have a very thin organic based surface horizon and are in the 7 to 14 inch precipitation zone. They are moderately productive and stable but do have areas with moderate or greater erosion potential, especially on slopes greater than 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-044 (The parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The entire parcel is BLM administered surface and mineral estates. The parcel has a VRM Class III classification. Parcel 044 falls within a Greater sage-grouse key habitat area and mapped Greater sage-grouse habitat. The parcel provides crucial big game

winter range, raptor nesting habitat, Greater sage-grouse nesting habitat, and mountain plover nesting habitat. The parcel also potentially provides habitat for white-tailed prairie dog, black-footed ferret, persistent sepal yellowcress, Cedar Rim thistle, and Wyoming pocket gopher. The parcel also has the potential to contain sensitive cultural resource sites. The riparian areas provide potential habitat for a variety of amphibian and/or reptilian species. Due to the private surface within and around the parcel, there is a potential to have occupied dwellings within ¼ mile. The parcel lies within the Great Divide Closed Basin watershed. The parcel is in the Separation Rim grazing allotment. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel contains slopes greater than 25 percent. The soils in parcel 044 are mid-elevation basin soils that are generally very shallow, with a depth to bedrock of less than 20 inches occurring in areas, they have a very thin organic based surface horizon and are in the 7 to 14 inch precipitation zone. They are moderately productive and stable but do have areas with moderate or greater erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-045 (The parcel is in RFO and would be available to be offered for lease under Alternatives B and C.): The entire parcel is BLM administered surface and mineral estates. The parcel has a VRM Class III classification. A portion of Parcel 045 falls within a Greater sage-grouse key habitat area and mapped Greater sage-grouse habitat. The parcel provides crucial big game winter range, Greater sage-grouse nesting habitat, and mountain plover nesting habitat. The parcel also potentially provides habitat for white-tailed prairie dog, black-footed ferret, persistent sepal yellowcress, and Wyoming pocket gopher. The riparian area provides potential habitat for a variety of amphibian and/or reptilian species. The parcel also has the potential to contain sensitive cultural resource sites. The parcel lies within the Great Divide Closed Basin watershed. The parcel is in the Stone and Stewart Creek grazing allotments. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel contains riparian habitat, but does not contain slopes greater than 25 percent. The soils are mid-elevation stabilized sand dunes that are moderate to deep, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and stable but do have areas with moderate or greater erosion potential, especially in blowout areas that are actively moving. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-046 (The parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The entire parcel is BLM administered surface and mineral estates. The parcel has a VRM Class III classification. Parcel 046 provides crucial big game winter range, raptor nesting habitat, Greater sage-grouse nesting habitat, and mountain plover nesting habitat. The parcel also potentially provides habitat for black-footed ferret, persistent sepal yellowcress, and Wyoming pocket gopher. The parcel also has the potential to contain sensitive cultural resource sites. The riparian areas provide potential habitat for a variety of amphibian and/or reptilian species. The parcel lies within the Great Divide Closed Basin watershed. The parcel falls within the Stone and Stewart Creek grazing allotments. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel does not contain slopes greater than 25 percent. The soils are basin soils that are generally very shallow, with a depth to bedrock of less than 20 inches occurring in areas, they have a very thin organic based surface horizon and are in the 5 to 9 inch precipitation zone. Soil productivity is low. Barren

areas do occur. These soils have a moderate or greater erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-047 (The parcel is in RFO would be available to be offered for lease under Alternatives B and C): The entire parcel is BLM administered surface and mineral estates. The parcel has a VRM Class III designation. Parcel 047 falls within a Greater sage-grouse key habitat area and mapped Greater sage-grouse habitat. The parcel provides crucial big game winter and Greater sage-grouse nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher. There are no known occupied dwellings within ¼ mile of the parcel. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel does not fall within a livestock grazing allotment. The parcel does not contain riparian habitat, nor does it contain slopes greater than 25 percent. The soils are high-elevation upland soils that are moderate to deep, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 15 to 19 inch precipitation zone. They are generally productive and stable but do have areas with moderate or greater erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-048 and WY-1111-049 (Both parcels are in RFO and would be available to be offered for lease under Alternatives B and C): The parcels are BLM administered surface and mineral estates. The parcels have a VRM Class III designation. The parcels do not fall within a Greater sage-grouse key habitat area, but do fall within mapped Greater sage-grouse habitat. The parcels provide Greater sage-grouse breeding and nesting habitat, as well as raptor nesting habitat. The parcels also potentially provide habitat for Wyoming pocket gopher. There are no known occupied dwellings within ¼ mile of the parcels. Both parcel are within the Colorado River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcels fall within the Cherokee livestock grazing allotment. The parcels contain riparian habitat, but do not contain slopes greater than 25 percent. The soils are mid- to high-elevation upland soils that are generally shallow, with a depth to bedrock of less than 20 inches occurring in areas. They have a thin organic based surface horizon and are in the 15 to 19 inch precipitation zone. They are moderately productive and stable but do have areas with moderate or greater erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-050 and WY-1111-051 (Both parcels are in RFO and would be available to be offered for lease under Alternatives B and C): The parcel is a combination of split estate lands (private surface/federal minerals) and federal lands administered by the BLM. The federal lands have a VRM Class III designation. Parcel 050 does not contain riparian habitat, whereas parcel 051 does. The parcels do not fall within a Greater sage-grouse key habitat area, but portions fall within mapped Greater sage-grouse habitat. The parcels provide crucial big game winter, Greater sage-grouse nesting, and raptor nesting habitat. The parcels also potentially provides habitat for Wyoming pocket gopher. Parcel 050 also potentially provides habitat for Beaver Rim phlox. Due to the private surface, the parcels have the potential to have occupied dwellings

within ¼ mile. The parcels lie within the Colorado River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcels fall within the Cottonwood Creek livestock grazing allotment. Neither parcel contains slopes greater than 25 percent. The soils are mid- to high-elevation upland soils that are generally shallow, with a depth to bedrock of less than 20 inches occurring in areas. They have a thin organic based surface horizon and are in the 15 to 19 inch precipitation zone. They are moderately productive and stable but do have areas with moderate or greater erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-052 (The parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The parcel is a combination of split estate lands (private surface/federal minerals) and federal lands administered by the BLM. The federal lands have a VRM Class III designation. Parcel 052 does not fall within a Greater sage-grouse key habitat area, but it does fall within mapped Greater sage-grouse habitat. The parcel provides crucial big game winter, Greater sage-grouse breeding and nesting, and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher, meadow pussytoes, and Gibbon's beardtongue. Due to the private surface, the parcel has the potential to have occupied dwellings on or within ¼ mile. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel falls within the South Pasture livestock grazing allotment. The parcel contains riparian habitat and slopes greater than 25 percent. The soils are mid-elevation upland soils that are generally shallow, with a depth to bedrock of less than 20 inches occurring in areas. They have a thin organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and stable but do have areas with moderate or greater erosion potential, especially on slopes greater than 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-053 (The parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The entire parcel is BLM administered surface and mineral estates. The parcel has a VRM Class III designation. Parcel 053 does not fall within a Greater sage-grouse key habitat area, but falls within mapped Greater sage-grouse habitat. The parcel provides crucial big game winter, Greater sage-grouse nesting, and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher and white-tailed prairie dog. There are no known occupied dwellings within ¼ mile of the parcel. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel falls within the Cherokee livestock grazing allotment. The parcel contains riparian habitat and slopes greater than 25 percent. The soils are mid-elevation upland soils that are generally shallow, with a depth to bedrock of less than 20 inches occurring in areas. They have a thin organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and stable but do have areas with moderate or greater erosion potential, especially on slopes greater than 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-054 (entire parcel is not available for oil and gas leasing)

WY-1111-055 (The parcel is in RFO would be available to be offered for lease under Alternatives B and C): The entire parcel is BLM administered surface and mineral estates and has a VRM Class III designation. Parcel 055 falls within a Greater sage-grouse key habitat area and mapped Greater sage-grouse habitat. The parcel provides crucial big game winter and migration habitat as it is in the Jep Canyon Wildlife Habitat Management Area (WHMA). The parcel also provides Greater sage-grouse nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher. There are no known occupied dwellings within ¼ mile of the parcel. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel also has the potential to contain sensitive cultural resource sites. The parcel falls within the Fillmore livestock grazing allotment and is adjacent to the Baggs to Rawlins Stage Road. The parcel does not contain riparian habitat or slopes greater than 25 percent. The soils are mid- to high-elevation upland soils that vary in depth, with a depth to bedrock of greater than 20 inches occurring in areas. They can have a thick organic based surface horizon and are in the 15 to 19 inch precipitation zone. They are moderately productive and are generally stable but do have areas with moderate or greater erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-056 (The parcel is in RFO and would be available to be offered for lease under Alternatives B and C): The entire parcel is BLM administered surface and mineral estates. The parcel has a VRM Class III classification. Parcel 056 falls within mapped Greater sage-grouse habitat. The parcel provides crucial big game winter range, Greater sage-grouse nesting habitat, and raptor nesting habitat. The parcel also potentially provides habitat for white-tailed prairie dog, black-footed ferret, and Wyoming pocket gopher. The riparian area provides potential habitat for a variety of amphibian and/or reptilian species. The parcel also has the potential to contain sensitive cultural resource sites. The parcel lies within the Great Divide Closed Basin watershed. The parcel would be located within the Stewart Creek grazing allotment. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel contains riparian habitat, but does not have slopes greater than 25 percent. The soils in parcel 056 are basin soils that are generally very shallow, with a depth to bedrock of less than 20 inches occurring in areas, they have a very thin organic based surface horizon and are in the 7 to 9 inch precipitation zone. Soil productivity is low and barren areas do occur. These soils have a moderate or greater erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-057 (The entire parcel would be available to be offered for lease under Alternatives B and C): The entire parcel is BLM administered surface and mineral estates and has a VRM Class III designation. Parcel 057 does not fall within a Greater sage-grouse key habitat area, but falls within mapped Greater sage-grouse habitat. The parcel provides Greater sage-grouse, raptor, and mountain plover nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher, black-footed ferret, and white-tailed prairie dog. The riparian area provides potential habitat for a variety of amphibian and/or reptilian species. There are no known occupied dwellings within ¼ mile of the parcel. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The predominant vegetation type is sagebrush dominated

shrublands with a variety of forbs and grasses. The parcel falls within the Cherokee livestock grazing allotment. The parcel contains riparian habitat, but does not have slopes greater than 25 percent. The soils are mid-elevation upland soils that are generally shallow, with a depth to bedrock of less than 20 inches occurring in areas. They have a thin organic based surface horizon and are in the 10 to 14 inch precipitation zone. They are moderately productive and stable but do have areas with moderate or greater erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-058 (The parcel is in RFO and would be deferred from leasing under Alternative B, but would be available in Alternative C): The entire parcel is BLM administered surface and mineral estates and has a VRM Class III designation. The parcel falls within the Adobe Town Dispersed Recreation Use Area (DRUA) that was derived through the Rawlins RMP analysis of a Citizen's Wilderness Proposal (CWP). Parcel 058 falls within mapped Greater sage-grouse habitat. The parcel provides Greater sage-grouse, raptor, and mountain plover nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel falls within the Espitalier grazing allotment. The parcel does not contain riparian habitat or slopes greater than 25 percent. The soils are mid-elevation basin soils that are generally very shallow, with a depth to bedrock of less than 20 inches occurring in areas, they have a very thin organic based surface horizon and are in the 7 to 9 inch precipitation zone. Soil productivity is low and barren areas do occur. These soils have a moderate or greater erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-059 (The parcel is RFO and would be deferred from leasing under Alternative B, but would be available in Alternative C): The entire parcel is BLM administered surface and mineral estates and has a VRM Class III designation. The parcel falls within the Adobe Town DRUA that was derived through the Rawlins RMP analysis of a Citizen's Wilderness Proposal (CWP). Parcel 059 falls within mapped Greater sage-grouse habitat. The parcel provides crucial winter range habitat, Greater sage-grouse nesting habitat, and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher. The parcel is in proximity and within the viewshed of the Cherokee Historic Trail and also has the potential to contain sensitive cultural resource sites. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel falls within the Espitalier and Crooked Wash grazing allotments. The parcel does not contain riparian habitat or slopes greater than 25 percent. The soils are mid-elevation basin soils that are generally very shallow, with a depth to bedrock of less than 20 inches occurring in areas, they have a very thin organic based surface horizon and are in the 7 to 9 inch precipitation zone. Soil productivity is low. Barren areas do occur. These soils have a moderate or greater erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-060 (The parcel is in RFO and would be deferred from leasing under Alternative B, but would be available in Alternative C): The entire parcel is federal lands and mineral estates

and has a VRM Class III designation. The parcel falls within the Adobe Town DRUA that was derived through the Rawlins RMP analysis of a CWP. Parcel 060 falls within mapped Greater sage-grouse habitat. The parcel provides Greater sage-grouse nesting habitat, mountain plover nesting habitat, and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher. The riparian area provides potential habitat for a variety of amphibian and/or reptilian species. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel falls within the Cow Creek and Corson Springs grazing allotments. The parcel contains riparian habitat, but does not contain slopes greater than 25 percent. The soils are mid-elevation basin soils that are generally very shallow, with a depth to bedrock of less than 20 inches occurring in areas, they have a very thin organic based surface horizon and are in the 7 to 9 inch precipitation zone. Soil productivity is low. Barren areas do occur. These soils have a moderate or greater erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-061 (The parcel is in RFO and would be deferred from leasing under Alternative B, but would be available in Alternative C): The parcel is federal surface and mineral estates and has a VRM Class III designation. The parcel falls within the Adobe Town DRU) that was derived through the Rawlins RMP analysis of a CWP. Parcel 061 falls within mapped Greater sage-grouse habitat. The parcel provides Greater sage-grouse nesting habitat, mountain plover nesting habitat, and raptor nesting habitat. The parcel also potentially provides habitat for Wyoming pocket gopher. The riparian area provides potential habitat for a variety of amphibian and/or reptilian species. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel falls within the Cow Creek grazing allotment. The parcel contains riparian habitat, but does not contain slopes greater than 25 percent. The soils are mid-elevation basin soils that are generally very shallow, with a depth to bedrock of less than 20 inches occurring in areas, they have a very thin organic based surface horizon and are in the 7 to 9 inch precipitation zone. Soil productivity is low. Barren areas do occur. These soils have a moderate or greater erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-062 and WY-1111-066 (The parcels are in RSFO and would be available to be offered for lease under Alternatives B and C): The parcels are located on federal surface and minerals within the checkerboard. Both parcels are in areas designated as Visual Resource Management (VRM) Class IV, which allow for major modification of the character of the landscape. Both parcels potentially provide habitat for the Wyoming pocket gopher and mountain plover. Parcel 066 also potentially provides habitat for white-tailed prairie dog. The parcels do not fall within a Greater sage-grouse key habitat area; however, Greater sage-grouse habitat is present. Parcel 062 is located within the Rock Springs grazing allotment, whereas parcel 066 is in the Rife allotment. Vegetation in the area is sparse with some sagebrush and sagebrush shrub steppe. The parcels lie within the Colorado River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. Parcel 066 is 640 acre section within the North Kinney citizen's wilderness proposal (note: the parcel is bounded on all four sides by private land). Both parcels are located in an area classified with a potential fossil yield class (PFYC) of five (5)—Very High for highly

fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. BLM Road 4412 crosses through both parcels. The parcels contain riparian habitat and slopes greater than 25 percent. The soils consist of deep sand dunes intermingled with moderately deep to very shallow, well drained, strongly alkaline soils formed on rolling upland plains and fans within a 7 to 9 inch precipitation zone. These sandy soils are very susceptible to wind erosion when the protective vegetative cover has been removed and typically have slopes of up to 10%. Also included in these parcel areas may be some areas of badlands. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-063 (The parcel is in the Rawlins and Rock Springs Field Offices and would be deferred from leasing under Alternative B, but would be available in Alternative C): The entire parcel is BLM administered surface and mineral estates. The parcel has a VRM Class III designation. The parcel falls within the Adobe Town DRUA that was derived through the Rawlins RMP analysis of a CWP. Parcel 063 falls within mapped Greater sage-grouse habitat. The parcel provides Greater sage-grouse and raptor nesting habitat. The parcel also potentially provides habitat for Cedar Rim thistle, boreal toad, and Wyoming pocket gopher. The riparian areas potentially provide habitat for a variety of amphibian and/or reptilian species. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel falls within the Espitalier (RFO) and Alkali Creek grazing allotments (RSFO). The parcel has slopes greater than 25 percent. The soils are mid-elevation basin soils that are generally very shallow, with a depth to bedrock of less than 20 inches occurring in areas, they have a very thin organic based surface horizon and are in the 7 to 9 inch precipitation zone. Soil productivity is low. Barren areas do occur. These soils have a moderate or greater erosion potential, especially on slopes greater than 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-064 (The parcel is in RFO and would be deferred from leasing under Alternative B, but would be available in Alternative C): The entire parcel is BLM administered surface and mineral estates and has a VRM Class III designation. The parcel falls within the Adobe Town DRUA that was derived through the Rawlins RMP analysis of a CWP. Parcel 064 falls within mapped Greater sage-grouse habitat. The parcel also potentially provides habitat for the Wyoming pocket gopher. The riparian areas potentially provide habitat for a variety of amphibian and/or reptilian species. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel falls within the Corson Springs grazing allotment. The parcel contains slopes greater than 25 percent. The soils are mid-elevation basin soils that are generally very shallow, with a depth to bedrock of less than 20 inches occurring in areas, they have a very thin organic based surface horizon and are in the 7 to 9 inch precipitation zone. Soil productivity is low. Barren areas do occur. These soils have a moderate or greater erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-065 (The parcel is in RFO would be deferred from leasing under Alternative B, but would be available in Alternative C): The entire parcel is BLM administered surface and

mineral estates and has a VRM Class III designation. The parcel falls within the Adobe Town DRUA that was derived through the Rawlins RMP analysis of a CWP. Parcel 065 falls within mapped Greater sage-grouse habitat. The parcel also potentially provides habitat for the boreal toad, prostrate bladderpod, meadow pussytoes, and Wyoming pocket gopher. The riparian areas potentially provide habitat for a variety of amphibian and/or reptilian species. The predominant vegetation type is sagebrush dominated shrublands with a variety of forbs and grasses. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel falls within the Corson Springs grazing allotment. The parcel contains slopes greater than 25 percent. The soils are mid-elevation basin soils that are generally very shallow, with a depth to bedrock of less than 20 inches occurring in areas, they have a very thin organic based surface horizon and are in the 7 to 9 inch precipitation zone. Soil productivity is low. Barren areas do occur. These soils have a moderate or greater erosion potential, especially on slopes greater than 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-067 (The parcel is in RSFO would be available to be offered for lease under Alternatives B and C): The entire parcel is federal land and mineral estate administered by the BLM and is located within the Whiskey Canyon oil and gas exploration unit. Lands within the parcel area are designated as VRM Class IV, which allow for major modification of the character of the landscape. The parcel potentially provides habitat for the Wyoming pocket gopher, mountain plover, white-tailed prairie dog, and pygmy rabbit. The parcel is partially located within the Greater sage-grouse key habitat area; however, is not surrounded by 11-square miles of manageable federal unleased land. The parcel also contains Greater sage-grouse breeding, nesting, and winter designated habitat areas. Additionally, the parcel is within area designated as Crucial Winter Range for antelope. The parcel is located within portions of the Pine Mountain and Vermillion Creek grazing allotments. Vegetation in the area consists mainly of sagebrush and sagebrush shrub steppe. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel is located in an area classified with a PFYC of three (3)—Moderate for fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence. The parcel is located entirely within the Pine Mountain Management Area and is subject to a Controlled Surface Use (CSU) stipulation. Parcel 067 contains moderately deep to very shallow, well drained soils formed on rolling upland plains dissected by rock ravines, short escarpments, and draws with a precipitation zone of 7 to 9 inches. These sandy soils are very susceptible to wind erosion when the protective vegetative cover has been removed and typically have slopes between 3-10%. The parcel does not contain riparian areas or slopes over 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-068 (The parcel is in RSFO and would be deferred under Alternative B and would be available to be offered for lease under Alternative C): The entire parcel is federal land and mineral estate administered by the BLM and is located within the Rubicon oil and gas exploration unit. Lands within the parcel area are designated as VRM Class III, for which actions must be designed to partially retain the existing character of the land. The parcel provides habitat for raptor nesting. The parcel does not fall within a Greater sage-grouse key habitat area; however, Greater sage-grouse habitat is present. The parcel is located within portions of the Mellor Mountain, Rock Springs, and Salt Wells grazing allotments. Vegetation

in the area consists mainly of sagebrush and sagebrush shrub steppe. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel is located in an area classified with a PFYC of five (5)—Very High for highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. The entire parcel is located within the Sage Creek portion of the Greater Red Creek ACEC and is subject to a CSU stipulation. The Cherokee Trail is present in Section 9 of the parcel and is subject to a CSU stipulation. Parcel 068 contains shallow and moderately deep, well drained soils formed on sloping upland plains with deep, steep-sided ravines and is within the precipitation zone of 10 to 14 inches. These highly erosive soils typically have slopes between 6-40%. The parcel does contain riparian areas along Trout Creek. Trout Creek contains a conservation population of Colorado River cutthroat trout CRCT). Other creeks in the vicinity of parcel 068 also containing conservation populations of CRCT are Sage Creek and Gooseberry Creeks. The parcel provides opportunities for outdoor recreation, including but not limited to hunting, fishing, wildlife viewing. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-069 (The parcel is in RSFO and would be deferred under Alternative B and would be available for lease under Alternative C): The entire parcel is federal lands and mineral estates administered by the BLM. Lands within the parcel area are designated as VRM Class IV, which allow for major modification of the character of the landscape. The parcel is also within the viewshed of the Sublette Cutoff National Historic Trail. The parcel is within designated Greater sage-grouse key habitat area and also provides nesting and winter habitat for Greater sage-grouse. The parcel potentially provides habitat for the white tailed prairie dog, mountain plover, and raptor nesting. Additionally, the parcel is within designated big game crucial winter range and is within the pronghorn migration corridor from Teton Park to Rock Springs (the longest ungulate migration route in the continental United States). The parcel is located within the Sublette grazing allotment. Vegetation consists mainly of sagebrush and sagebrush shrub steppe. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel is located in an area classified with a PFYC of five (5)—Very High for highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. Parcel 069 contains deep, moderately well drained soils formed in fine textured, saline and/or alkaline alluvial or lacustrine sediments on nearly level basins and fans; and has a precipitation zone of 6 to 9 inches. These sandy soils are very susceptible to wind erosion when the protective vegetative cover has been removed and typically have slopes between 1-10%. The parcel does not contain riparian areas or slopes over 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-070 and WY-1111-071 (Both parcels are in RSFO and would be deferred under Alternative B and would be available for lease under Alternative C): The parcels are federal lands and mineral estates administered by the BLM. Lands within the area of the parcels are designated as VRM Class IV, which allow for major modification of the character of the landscape. The parcels are within designated Greater sage-grouse key habitat area and also provide breeding, nesting and winter habitat for Greater sage-grouse. The parcels potentially provides habitat for the white tailed prairie dog, and mountain plover. Additionally, the parcels are within designated big game crucial winter range and is within the pronghorn migration corridor from Teton Park to Rock Springs (the longest ungulate migration route in the continental United States).

The parcels are located within portions of the Sublette and Eighteen Mile grazing allotments. Vegetation consists mainly of sagebrush and sagebrush shrub steppe. The parcels lie within the Colorado River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcels are located in an area classified with a PFYC of five (5)—Very High for highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. The Sublette Cutoff of the Oregon/Mormon Trail crossed portions of both parcels and is subject to a CSU stipulation. Parcels 070 and 071 contain deep, moderately well drained soils formed in fine textured, saline and/or alkaline alluvial or lacustrine sediments on nearly level basins and fans; and are in a 6 to 9 inch precipitation zone. These sandy soils are very susceptible to wind erosion when the protective vegetative cover has been removed and typically have slopes between 1-10%. The parcels do not contain riparian areas or slopes over 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-072 and WY-1111-073 (Both parcels are in RSFO and would be deferred under Alternative B and would be available for lease under Alternative C): The parcels are federal lands and mineral estates administered by the BLM. Lands within the area contain the parcels are designated as VRM Class IV, which allow for major modification of the character of the landscape. The parcel is also within the viewshed of the Sublette Cutoff National Historic Trail. The parcels are within designated Greater sage-grouse key habitat area and also provide nesting and winter habitat for Greater sage-grouse. They potentially provide habitat for the white tailed prairie dog and mountain plover. Additionally, the parcels are within designated big game crucial winter range and is within the pronghorn migration corridor from Teton Park to Rock Springs (the longest ungulate migration route in the continental United States). They are located within portions of the Sublette and Big Sandy grazing allotments. Parcel 073 also falls is a portion of the Eighteen Mile allotment. Vegetation consists mainly of sagebrush and sagebrush shrub steppe. The parcels lie within the Colorado River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcels are located in an area classified with a PFYC of five (5)—Very High for highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. Parcels 072 and 073 contain deep, moderately well drained soils formed in fine textured, saline and/or alkaline alluvial or lacustrine sediments on nearly level basins and fans; and are in a 6-9 inch precipitation zone. These sandy soils are very susceptible to wind erosion when the protective vegetative cover has been removed and typically have slopes between 1-10%. The parcels do not contain riparian areas or slopes over 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-074, WY-1111-075, WY-1111-076 (All three parcels are in PFO. Parcels 074 and 076 would be available to be offered for lease under Alternatives B and C. Parcel 075 would be deferred under Alternative B and available to be offered for lease under Alternative C)**:** The parcels are federal surface and mineral. They are bounded by the Jonah and Pinedale Anticline gas fields. Terrain ranges from generally flat to gently rolling, with elevations from about 7,270 to 7300 feet above sea level. All three parcels are in a Class IV VRM area. The parcels are in Greater sage-grouse nesting habitat, but are not in key habitat. Parcels 075 and 076 contain Greater sage-grouse breeding habitat. The parcels contain raptor nesting, mountain plover, and pygmy rabbit habitat, as well as habitat for sensitive passerine species, such as sage thrasher and

sage sparrow. The parcels are located in pronghorn migration corridor from Teton Park to Rock Springs (the longest ungulate migration route in the continental United States) and also within the Stud Horse Common grazing allotment. The predominant vegetation type is sagebrush dominated shrubland with a variety of forbs and grasses. The parcel also may contain sensitive or significant cultural resource sites. Parcel 075 falls within the Rocks Archaeological District (48SU4000). The area has the potential to contain paleontological resources. All three parcels are within the Colorado River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The soils are productive, moderately deep upland soils with 2-15% slopes. Erosion potential is slight to moderate. The parcels do not contain riparian habitat or slopes greater than 25 percent. Total precipitation in the area is typically 12 to14 inches per year. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-077 (The parcel is in RSFO and would be available to be offered for lease under Alternatives B and C): The parcel is federal lands and mineral estates administered by the BLM. This parcel is entirely within the Bridger Rendezvous oil and gas exploration unit. Lands within the parcel area are designated as VRM Class IV, which allow for major modification of the character of the landscape. The parcel potentially provides habitat for the mountain plover and Idaho pocket gopher. The parcel does not fall within a Greater sage-grouse key habitat area and no Greater sage-grouse habitat is present. The parcel is within area designated as Crucial Winter Range for antelope. The parcel is located within the Cedar Mountain grazing allotment. Vegetation in the area is sparse with some sagebrush grassland. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel is located in an area classified with a PFYC of five (5)—Very High for highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. The parcel is located entirely within the Known Sodium Leasing Area (KSLA). The Cherokee Trail is present in Sections 28 and 29 of the parcel and is subject to a Controlled Surface Use stipulation. Parcel 077 contains moderately deep to very shallow, well drained soils formed on rolling upland plains dissected by rock ravines, short escarpments, and draws with a precipitation zone of 7 to 9 inches. These sandy soils are very susceptible to wind erosion when the protective vegetative cover has been removed and typically have slopes between 3-10%The parcel does not contain riparian areas or slopes over 25 percent. BLM Road 4315 crosses through the northern area of the parcel. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-078 (The parcel s in PFO and is not available for oil and gas leasing)

WY-1111-079 (The parcel is in RSFO and would be available to be offered for lease under Alternatives B and C): The parcel is a combination of split estate lands (private surface/federal minerals) and federal lands administered by the BLM. Federal lands within the parcel area are designated as VRM Class IV, which allow for major modification of the character of the landscape. The parcel potentially provides habitat for the mountain plover and Idaho pocket gopher. The parcel does not fall within a Greater sage-grouse key habitat area; however, Greater sage-grouse habitat is present. The parcel is within area designated as Crucial Winter Range for mule deer. The parcel is located within the Cedar Mountain grazing allotment. Vegetation consists mainly of sagebrush with a various grasses and forbs, as well as basin-prairie shrub, including juniper and mountain mahogany. The parcel lies within the Colorado River watershed

and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel is located in an area classified with a PFYC of five (5)—Very High for highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. The following portions of the parcel are located within the Special Status (Candidate) ACEC and are subject to a 'No Surface Occupancy'(NSO): North ½ of Section 3, SE ¼ of Section 9, and SW ¼ of Section 10 of Township 13 N Range 111 West. Parcel 079 contains moderately deep to very shallow, well drained soils formed on rolling upland plains dissected by rock ravines, short escarpments, and draws with a precipitation zone of 7 to 9 inches. These sandy soils are very susceptible to wind erosion when the protective vegetative cover has been removed and typically have slopes between 3-10%; however the parcel also contains areas with slopes greater than 25 percent. The parcel contains riparian habitat. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-080 (The parcel is in RFO and would be available to be offered for lease under Alternative C, but a portion would be deferred in Alternative B): The parcel is a combination of split estate lands (private surface/federal minerals) and federal lands administered by the BLM. Federal lands within the parcel area are designated as VRM Class IV, which allows for major modification of the character of the landscape. Portions of the parcel are within designated Greater sage-grouse key habitat area and the entire parcel provides nesting and winter habitat for Greater sage-grouse. The parcel potentially provides habitat for the mountain plover, Idaho pocket gopher, and raptor nesting. Additionally, the parcel is within designated big game Crucial Winter Range. The parcel is located within the Cedar Mountain grazing allotment. Vegetation consists mainly of sagebrush with a various grasses and forbs, as well as sagebrush shrub steppe, including juniper and mountain mahogany. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel is located in an area classified with a PFYC of five (5)—Very High for highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. The following portions of the parcel are located within the Special Status (Candidate) ACEC and are subject to a NSO: North ½ of Section 5 of Township 13 N Range 111 West. Parcel 080 contains shallow to deep, well drained soils formed on steep mountain slopes. The precipitation zone is 12 to 19 inches. These unstable soils typically have slopes between 15-50% and are susceptible to landslides or slumping activity and may be a hazard to permanent structures. The parcel contains riparian habitat. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-081, WY-1111-084, WY-1111-085, and WY-1111-086 (All four parcels are in RSFO and would be available to be offered for lease under Alternatives C, but would be deferred in Alternative B): The parcels are federal lands and mineral estates administered by the BLM. The parcels are in areas designated as VRM Class IV, which allows for major modification of the character of the landscape. They are within designated Greater sage-grouse key habitat area and provide nesting and winter habitat for Greater sage-grouse. Parcel 085 provides Greater sage-grouse breeding habitat. All four parcels potentially provide habitat for the mountain plover, white-tailed prairie dog and Idaho pocket gopher. Parcels 081 located within the Cedar Mountain grazing allotment. Parcels 084 and 086 are with the Cedar Mountain and Sage Creek Mountain allotments. Parcel 085 is within the Sage Creek Mountain allotment. Vegetation consists mainly of sagebrush with a various grasses and forbs, as well as sagebrush shrub steppe.

The parcels are within the Colorado River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcels are located in an area classified with a PFYC of five (5)—Very High for highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. Portions of the parcels are located within the Special Status (Candidate) ACEC and are subject to a NSO stipulation. BLM Road 4314 bisects all four parcels. Parcels 081 and 084 contain deep, well drained gravelly sandy loam and sandy loam soils formed on nearly level to sloping tablelands and mountain tops and has a precipitation zone of 12 to 19 inches. These sandy soils are very susceptible to wind erosion when the protective vegetative cover has been removed and typically have slopes between 1-10%. They also contain riparian areas. Parcels 085 and 086 contain shallow to deep, well drained soils formed on steep mountain slopes. The precipitation zone is 12 to 19 inches. These unstable soils typically have slopes between 15-50% and are susceptible to landslides or slumping activity and may be a hazard to permanent structures. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-082 (The parcel is in RSFO and would be available to be offered for lease under Alternatives B and C): The parcel is federal land and mineral estate administered by the BLM. Lands within the parcel area are designated as VRM Class IV, which allow for major modification of the character of the landscape. The parcel potentially provides habitat for the mountain plover, Idaho pocket gopher, and raptor nesting. Portions of the parcels are located within the Special Status (Candidate) ACEC and are subject to a NSO stipulation. The parcel does not fall within a Greater sage-grouse key habitat area; however, Greater sage-grouse habitat is present. The parcel is within area designated as Crucial Winter Range for mule deer. The parcel is located within the Cedar Mountain grazing allotment. Vegetation consists mainly of sagebrush with a various grasses and forbs, as well as sagebrush shrub steppe, including juniper and mountain mahogany. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel is located in an area classified with a PFYC of five (5)—Very High for highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. Parcel 082 contains moderately deep to very shallow, well drained soils formed on rolling upland plains dissected by rock ravines, short escarpments, and draws with a precipitation zone of 7 to 9 inches. These sandy soils are very susceptible to wind erosion when the protective vegetative cover has been removed and typically have slopes between 3-10%. The parcel contains some riparian and some slopes over 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-083 and WY-1111-087 (Part of parcel 083 and all of parcel 087 would be deferred under Alternative. Both parcels are in RSFO and would be available under Alternative C): Both parcels contain split estate both and federal surface ownership. The parcels are in areas designated as VRM Class IV, which allow for major modification of the character of the landscape. The parcels are within designated Greater sage-grouse key habitat area and provide nesting and winter habitat for Greater sage-grouse. They also potentially provides habitat for the mountain plover, white-tailed prairie dog, and Idaho pocket gopher. Parcel 087 also has raptor nesting habitat. Additionally, both parcels are within designated big game Crucial Winter Range and fall within portions of the Cedar Mountain grazing allotment. Parcel 083 also falls within part of the Sage Creek Mountain allotment. Vegetation consists mainly of sagebrush with a

various grasses and forbs, as well as sagebrush shrub steppe, including juniper and mountain mahogany. The parcels are within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcels are located in an area classified with a PFYC of five (5)—Very High for highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. Portions of both parcels are located within the Special Status (Candidate) ACEC and are subject to a NSO stipulation. Parcels 083 and 087 contains deep, well drained gravelly sandy loam and sandy loam soils formed on nearly level to sloping tablelands and mountain tops and have a precipitation zone of 12 to 19 inches. These sandy soils are very susceptible to wind erosion when the protective vegetative cover has been removed and typically have slopes between 1-10%. Both parcels have riparian habitat and slopes over 25 percent. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-088 and WY-1111-089 (Both are in KFO and RSFO are available to be offered for lease under Alternatives B and C): The parcels are federal lands and mineral estates administered by the BLM. The parcels are within areas designated as VRM Class III, for which actions must be designed to partially retain the existing character of the land. They potentially provides habitat for the mountain plover and Idaho pocket gopher. Parcel 089 also has raptor nesting habitat. Both parcels are located within the Greater sage-grouse key habitat area; however, neither parcel meets the IM WY-2010-013 manageability criteria. They contain Greater sage-grouse breeding, nesting, and winter designated habitat areas and are within areas designated as Crucial Winter Range for mule deer. Parcel 088 is located within portions of the Hickey Mountain grazing allotment (RSFO) and the Sage Creek grazing allotment (KFO). Parcel 089 is within the Sage Creek Mountain (RSFO) and Sage Creek (KFO) allotments. Vegetation in the area consists mainly of sagebrush and sagebrush grassland. The parcels lie within the Colorado River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. Portions of the parcel are located in an area classified with a PFYC of five (5)—Very High for highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. The remaining portions of the parcel are within an area classified with a PFYC of three (3)—Moderate for fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence. Parcels 088 and 089 contain moderately deep to very shallow, well drained soils formed on rolling upland plains dissected by rock ravines, short escarpments, and draws with an average precipitation of 7 to 9 inches. These sandy soils are very susceptible to wind erosion when the protective vegetative cover has been removed and typically have slopes between 3-10%. Both parcels have slopes over 25 percent. Parcel 089 has riparian habitat. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-090 and WY-1111-091 (Parcel 090 is in KFO and RSFO. Parcel 091 is in KFO. Both parcels are available to be offered for lease under Alternative B and C): A portion of the parcels are split estate (private surface/federal minerals), the rest is federal land administered by BLM. The BLM lands have a combination of VRM Class II and III designations. Both parcels are located within the Greater sage-grouse key habitat area; however, due not meet the IM WY-2010-013 manageability criteria. They contain Greater sage-grouse nesting habitat and are within Crucial Big Game Winter Range. Parcel 090 provides potential habitat for Uinta greenthread, white-tailed prairie dog, and Idaho pocket gopher and is in the Sage Creek grazing

allotment. Parcel 091 provides potential habitat for prostrate bladderpod, ferruginous hawk, white-tailed prairie dog, and Idaho pocket gopher and is in portions of the Sage Creek, Cottonwood, Crooked Canyon, and Leavitt Bench grazing allotments. Vegetation in the area consists of sagebrush, juniper, conifer (not in parcel 091), irrigated crops, various grasses and forbs. The parcels lie within the Colorado River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcels contains riparian habitat and slopes greater than 25 percent or sensitive soils. Occupied dwellings may exist within ¼ mile of the parcel. The parcel falls within the Green River Basin Upland soils group with soils formed in shales producing clayey textures with poor surface water infiltration, high runoff potential, and high carbonate levels that create a high potential for water erosion. Also common in this group, are soils with surface textures that are highly susceptible to water erosion due to a high proportion of fine sands or silts with little binding material or silt-sized carbonates. Many soils in this group are susceptible to excessive wind erosion due to sandy surface textures, low organic matter, and high carbonate content. This soil group has a high proportion of saline soils, especially in low topographic areas, such as drainages and areas below marine shale outcrops. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-092 (The parcel is in KFO and would be available to be offered for lease under Alternative B and C): The parcel is federal land and mineral estate administered by BLM. The parcel is in VRM Class IV. The parcel is not in a Greater sage-grouse key habitat area, but contains Greater sage-grouse nesting habitat and raptor nesting habitat. Parcel 092 provides potential habitat for white-tailed prairie dog, black-footed ferret, and Idaho pocket gopher and is in the Carter grazing allotment. Vegetation in the area consists of sagebrush, desert shrubs, and various grasses and forbs. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel does not contain riparian habitat and slopes greater than 25 percent or sensitive soils and does not have occupied dwellings within ¼ mile. The parcel falls within the Green River Basin Upland soils group with soils formed in shales producing clayey textures with poor surface water infiltration, high runoff potential, and high carbonate levels that create a high potential for water erosion. Also common in this group, are soils with surface textures that are highly susceptible to water erosion due to a high proportion of fine sands or silts with little binding material or silt-sized carbonates. Many soils in this group are susceptible to excessive wind erosion due to sandy surface textures, low organic matter, and high carbonate content. This soil group has a high proportion of saline soils, especially in low topographic areas, such as drainages and areas below marine shale outcrops. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-093 and WY-1111-094 (Both parcels are in KFO and would be available to be offered for lease under Alternative B and C): A portion of the parcels are split estate (private surface/federal minerals), the rest is federal land administered by BLM. Parcel 093 has a VRM Class III designation, whereas parcel 094 has Class III and IV. Neither parcel is located within the Greater sage-grouse key habitat area. Both parcels provide potential habitat for Idaho pocket gopher, pygmy rabbit, and tufted twinpod and is in the Slate Creek and Quealy Peak grazing allotments. Parcel 094 also provides potential habitat for prostrate bladderpod and Beaver Rim phlox. Vegetation in the area consists of sagebrush, and various upland grasses and forbs. The parcels lie within the Colorado River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcels contain

riparian habitat and slopes greater than 25 percent. Occupied dwellings may exist within ¼ mile of the parcel. The parcels fall within the Green River Basin Upland soils group with soils formed in shales producing clayey textures with poor surface water infiltration, high runoff potential, and high carbonate levels that create a high potential for water erosion. Also common in this group, are soils with surface textures that are highly susceptible to water erosion due to a high proportion of fine sands or silts with little binding material or silt-sized carbonates. Many soils in this group are susceptible to excessive wind erosion due to sandy surface textures, low organic matter, and high carbonate content. This soil group has a high proportion of saline soils, especially in low topographic areas, such as drainages and areas below marine shale outcrops. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-095 and WY-1111-096 (Both parcels are in KFO and would be available to be offered for lease under Alternative B and C): Portions of the parcels are split estate (private surface/federal minerals), the rest is federal land administered by BLM. The parcels are in VRM Class III. Neither parcel is in a Greater sage-grouse key habitat area. Parcel 095 contains Greater sage-grouse nesting habitat and raptor nesting habitat. It also provides potential habitat for Idaho pocket gopher, pygmy rabbit, white-faced ibis, prostrate bladderpod, tufted twinpod. Parcel 096 contains raptor nesting habitat, white-tailed prairie dog habitat and crucial big game winter range, as well as providing potential habitat for Idaho pocket gopher, pygmy rabbit, prostrate bladderpod, and tufted twinpod. Both parcels are in the Pomeroy Basin and East Willow Creek grazing allotments. Vegetation in the area consists of sagebrush, and various upland grasses and forbs. The parcels lie within the Colorado River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. Parcel 095 contains riparian habitat and slopes greater than 25 percent. Parcel 096 has slopes over 25 percent, but no riparian habitat. Both parcels have occupied dwellings on or within ¼ mile. The parcels fall within the Green River Basin Upland soils group with soils formed in shales producing clayey textures with poor surface water infiltration, high runoff potential, and high carbonate levels that create a high potential for water erosion. Also common in this group, are soils with surface textures that are highly susceptible to water erosion due to a high proportion of fine sands or silts with little binding material or silt-sized carbonates. Many soils in this group are susceptible to excessive wind erosion due to sandy surface textures, low organic matter, and high carbonate content. This soil group has a high proportion of saline soils, especially in low topographic areas, such as drainages and areas below marine shale outcrops. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-097, WY-1111-100, and WY-1111-101 (All three parcels are in KFO and would be available to be offered for lease under Alternative C, but would be deferred in Alternative B): Portions of the parcels are split estate (private surface/federal minerals), the rest is federal land administered by BLM. The parcels are in VRM Class II. All three parcels are completely or partially in a Greater sage-grouse key habitat area. Parcel 097 contains Greater sage-grouse and, raptor nesting habitat, as well as crucial big game winter range. It also provides potential habitat for Idaho pocket gopher and ferruginous hawk. Parcels 100 and 101 contains raptor nesting habitat and Greater sage-grouse nesting habitats well as providing potential habitat for Idaho pocket gopher. Parcel 100 also contains Greater sage-grouse breeding habitat and crucial big game winter range. All three parcels are in the Mammoth Hollow and Slate Creek grazing allotments. Parcel 097 is also in part of the Pomeroy Basin allotment. Vegetation in the area

consists of sagebrush, and various upland grasses and forbs. The parcels lie within the Colorado River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. All three parcels contain riparian habitat and slopes greater than 25 percent. All three have a potential to have occupied dwellings on or within ¼ mile. Parcel 097 contains Class 1 segments of Sublette and Dempsey-Hockaday National Historic Trails. Portions of parcels 100 and 101 are within the viewshed of these historic trails. The parcels fall within the Green River Basin Upland soils group with soils formed in shales producing clayey textures with poor surface water infiltration, high runoff potential, and high carbonate levels that create a high potential for water erosion. Also common in this group, are soils with surface textures that are highly susceptible to water erosion due to a high proportion of fine sands or silts with little binding material or silt-sized carbonates. Many soils in this group are susceptible to excessive wind erosion due to sandy surface textures, low organic matter, and high carbonate content. This soil group has a high proportion of saline soils, especially in low topographic areas, such as drainages and areas below marine shale outcrops. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-098 and WY-1111-099 (Both parcels are in KFO. Parcel 098 also crosses into PFO, Both would be available to be offered for lease under Alternative C, but would be deferred in Alternative B): Portions of parcel 098 are split estate (private surface/federal minerals), the rest is federal land administered by BLM. Parcel 099 is federal. The parcels are in VRM Class II. Neither parcel is in a Greater sage-grouse key habitat area. Both parcels contain Greater sage-grouse nesting habitat. Parcel 098 has crucial big game winter range. They also provide potential habitat for Idaho pocket gopher. The parcels are in the Mammoth Hollow and Slate Creek grazing allotments. Vegetation in the area consists of sagebrush, and various upland grasses and forbs. The parcels lie within the Colorado River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. Both parcels contain riparian habitat and slopes greater than 25 percent. Both have a potential to have occupied dwellings within ¼ mile. The parcels fall within the Green River Basin Upland soils group with soils formed in shales producing clayey textures with poor surface water infiltration, high runoff potential, and high carbonate levels that create a high potential for water erosion. Also common in this group, are soils with surface textures that are highly susceptible to water erosion due to a high proportion of fine sands or silts with little binding material or silt-sized carbonates. Many soils in this group are susceptible to excessive wind erosion due to sandy surface textures, low organic matter, and high carbonate content. This soil group has a high proportion of saline soils, especially in low topographic areas, such as drainages and areas below marine shale outcrops. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-102 and WY-1111-114 (Both parcels are in KFO and would be available to be offered for lease under Alternatives B and C): The parcels are federal lands administered by BLM. The parcels are in VRM Class IV. Parcel 102 is in a Greater sage-grouse key habitat area, but does not meet the WY-2010-013 manageability criteria. Parcel 114 is not in a Greater sage-grouse key habitat area. Parcel 102 has Greater sage-grouse and raptor nesting habitat, and crucial big game winter range. It also provides potential habitat for black-footed ferret, pygmy rabbit, and Idaho pocket gopher. Parcel 114 contains crucial big game winter range habitat and provides potential habitat for pygmy rabbit, Beaver Rim phlox, and Idaho pocket gopher. Both parcels are in the Cumberland Flats grazing allotments. Parcel 102 also occupies part of the

Elkol allotment. Vegetation in the area consists of sagebrush, desert shrubs, and various upland grasses and forbs. The parcels lie within the Colorado River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. Neither parcel contains riparian habitat, but they do have slopes greater than 25 percent. Neither has occupied dwellings within ¼ mile. The parcels contain upland soils. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. The soils are stable and have a low erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-103 (The parcel is in KFO and would be available to be offered for lease under Alternative B and C): Portions of parcel 103 is split estate (private surface/federal minerals), the rest is federal land administered by BLM. The parcel is in VRM Class III. The parcel is not in a Greater sage-grouse key habitat area, but does contain Greater sage-grouse and raptor nesting habitat. It also provides potential habitat for pygmy rabbit, Beaver Rim phlox, prostrate bladderpod, tufted twinpod, and Idaho pocket gopher and is in the Pomeroy Basin, West Willow Creek grazing allotment. Vegetation in the area consists of sagebrush and various grasses and forbs. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel contains riparian habitat, slopes greater than 25 percent, and occupied dwellings. The parcel contains upland soils. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. The soils are stable and have a low erosion potential. The parcel also contains floodplains and riparian areas that are highly productive. These soils are generally comprised of silty clays with a gravel or rock component. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-104 (The parcel is in KFO and would be available to be offered for lease under Alternative B and C): The parcels is federal land administered by BLM and has a VRM Class III classification. The parcel is not in a Greater sage-grouse key habitat area. Parcel 104 has crucial big game winter range. It also provides potential habitat for pygmy rabbit, Beaver Rim phlox, prostrate bladderpod, and Idaho pocket gopher and is in the Airport grazing allotment. Portions of the parcel are within 10,000 feet of the Kemmerer Municipal Airport runways. Vegetation in the area consists of sagebrush and various grasses and forbs. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel does not contain riparian habitat or occupied dwellings, but does have slopes greater than 25 percent. The parcel contains upland soils. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex

soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. The soils are stable and have a low erosion potential. The parcel also contains floodplains and riparian areas that are highly productive. These soils are generally comprised of silty clays with a gravel or rock component. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-105 (The parcel is in KFO and would available to be offered for lease under Alternative C, but a portion of the parcel would be deferred under Alternative B): The parcel is federal land administered by BLM and is in VRM Class II. Part of the parcel is in a Greater sage-grouse key habitat area and has crucial big game winter range and raptor nesting habitat. It also provides potential habitat for ferruginous hawk, Greater sage-grouse, Idaho pocket gopher, and tufted twinpod and is in the Pomeroy Basin grazing allotment. Vegetation in the area consists of sagebrush, various grasses and forbs, aspen, and mixed conifer species. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel contains riparian habitat and slopes greater than 25 percent, but does not have occupied dwellings. The parcel contains upland soils. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. The soils are stable and have a low erosion potential. The parcel also contains riparian areas that are highly productive. These soils are generally comprised of silty clays with a gravel or rock component. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-106 and WY-1111-107 (Both parcels are in KFO and would be available to be offered for lease under Alternatives B and C): Portions of both parcels are split estate (private surface/federal minerals), the rest is federal land administered by BLM. The parcels are in VRM Class II. Neither parcel is in a Greater sage-grouse key habitat area. Both parcels contain Greater sage-grouse nesting habitat. They also provide potential habitat for Canada lynx, Idaho pocket gopher, and Trelease's milkvetch. The parcels are in the Mammoth Hollow grazing allotment. Parcel 107 also overlaps into the Commissary allotment. Vegetation in the area consists of sagebrush, various grasses and forbs, aspen, and mixed conifer species. The parcels lie within the Colorado River watershed and are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. Both parcels have riparian habitat, occupied dwellings and slopes greater than 25 percent. The parcels contain upland soils. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. The soils are stable and have a low erosion potential. The parcels also contain riparian areas that are highly productive. These soils are generally comprised of silty clays with a gravel or rock component. Refer to Appendices C,

D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-108 (The parcel is in KFO and would be available to be offered for lease under Alternatives B and C): The parcels is federal land administered by BLM. The parcel is in VRM Class II. The parcel is not in a Greater sage-grouse key habitat area, but does have crucial big game winter range and raptor nesting habitat. It also provides potential habitat for Idaho pocket gopher, pygmy rabbit, and Beaver Rim phlox and is in the Coal Mine Draw, Haystack Draw grazing allotment. Vegetation in the area consists of sagebrush, various grasses and forbs, and juniper woodlands. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel contains riparian habitat and slopes greater than 25 percent, but does not have occupied dwellings. The parcel contains upland soils. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. The soils are stable and have a low erosion potential. The parcel also contains riparian areas that are highly productive. These soils are generally comprised of silty clays with a gravel or rock component. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-109 (The parcel is in KFO and would be available to be offered for lease under Alternatives B and C): The parcels is federal land administered by BLM. The parcel is in VRM Class II and IV. The parcel is within a Greater sage-grouse key habitat area, but does not meet the IM WY-2010-013 manageability criteria. The parcel has white-tailed prairie dog and raptor nesting habitat, as well as crucial big game winter range. It also provides potential habitat for Greater sage-grouse, black-footed ferret, Idaho pocket gopher, pygmy rabbit, and Beaver Rim phlox and is in the Albert Creek grazing allotment. Vegetation in the area consists of sagebrush, various grasses and forbs, and juniper woodlands. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel contain riparian habitat and slopes greater than 25 percent, but does not have occupied dwellings. The parcel contains upland soils. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. The soils are stable and have a low erosion potential. The parcel also contains riparian areas that are highly productive. These soils are generally comprised of silty clays with a gravel or rock component. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-110 (The parcel is in KFO and would be available to be offered for lease under Alternatives B and C): The parcels is federal land administered by BLM. The parcel is in VRM Class 1V. The parcel is within a Greater sage-grouse key habitat area, but does not meet the IM WY-2010-013 manageability criteria. The parcel has white-tailed prairie dog, Greater sage-

grouse nesting, mountain plover, and raptor nesting habitat, as well as crucial big game winter range. It also provides potential habitat for black-footed ferret, Idaho pocket gopher, pygmy rabbit, large-fruited bladderpod, tufted twinpod, and Beaver Rim phlox and is in the Albert Creek, and Cumberland/Uinta grazing allotment. Vegetation in the area consists of sagebrush and various grasses and forbs. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel does not contain riparian habitat or occupied dwellings, but does have slopes greater than 25 percent. The parcel contains upland soils. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. The soils are stable and have a low erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-111 (The parcel is in KFO and would be available to be offered for lease under Alternatives B and C): The parcels is federal land administered by BLM. The parcel is in VRM Class II and IV. The parcel is within a Greater sage-grouse key habitat area, but does not meet the IM WY-2010-013 manageability criteria. The parcel has white-tailed prairie dog, Greater sage-grouse nesting, mountain plover, and raptor nesting habitat, as well as crucial big game winter range. It also provides potential habitat for black-footed ferret, Idaho pocket gopher, and pygmy rabbit and Beaver Rim phlox and is in the Albert Creek, Haystack Draw, and Cumberland/Uinta grazing allotments. Vegetation in the area consists of sagebrush, various grasses and forbs, and desert shrubs. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel contains riparian habitat and slopes greater than 25 percent, but does not have occupied dwellings. The parcel contains upland soils. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. The soils are stable and have a low erosion potential. The parcel also contains riparian areas that are highly productive. These soils are generally comprised of silty clays with a gravel or rock component. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-112 (The parcel is in KFO and would be available to be offered for lease under Alternative C, but would be deferred in Alternative B): The parcel is federal land administered by BLM. The parcel is in VRM Class II. The parcel is within a Greater sage-grouse key habitat area, but does not meet the IM WY-2010-013 manageability criteria. The parcel has white-tailed prairie dog, and raptor nesting habitat, as well as crucial big game winter range. It also provides potential habitat for black-footed ferret, Idaho pocket gopher, Greater sage-grouse, ferruginous hawk, pygmy rabbit, Trelease's milkvetch, tufted twinpod, and Beaver Rim phlox and is in the Albert Creek, Carter Lease, Coal Mine Draw, and Haystack Draw grazing allotments. Vegetation in the area consists of sagebrush, various grasses and forbs, juniper woodlands, and

desert shrubs. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel contains riparian habitat and slopes greater than 25 percent, but does have occupied dwellings. Parcel 112 contains the Bridger Antelope Trap prehistoric site. The parcel contains upland soils. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. The soils are stable and have a low erosion potential. The parcel also contains riparian areas that are highly productive. These soils are generally comprised of silty clays with a gravel or rock component. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-113 (The parcel is in KFO and would be available to be offered for lease under Alternatives B and C): The parcels is federal land administered by BLM. The parcel is in VRM Class II and IV. The parcel is within a Greater sage-grouse key habitat area, but does not meet the IM WY-2010-013 manageability criteria. The parcel has white-tailed prairie dog, Greater sage-grouse, and raptor nesting habitat, as well as crucial big game winter range. It also provides potential habitat for black-footed ferret, Idaho pocket gopher, ferruginous hawk, pygmy rabbit, and Beaver Rim phlox and is in the Cumberland/Uinta, Cumberland Flats grazing allotment. Vegetation in the area consists of sagebrush, various grasses and forbs, and desert shrubs. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel does not contain riparian habitat or occupied dwellings, but does have slopes greater than 25 percent. Parcel 113 contains Class 1 segments of Oregon-California National Historic Trail. The parcel contains upland soils. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. The soils are stable and have a low erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-115 (The parcel is in KFO and would be available to be offered for lease under Alternatives B and C): The parcels is federal land administered by BLM. The parcel is in VRM Class IV. The parcel is not in a Greater sage-grouse key habitat area. The parcel has white-tailed prairie dog, and raptor nesting habitat, as well as crucial big game winter range. It also provides potential habitat for black-footed ferret, Idaho pocket gopher, ferruginous hawk, pygmy rabbit, and Beaver Rim phlox and is in the Haystack Draw and Kemmerer Junction grazing allotments. Vegetation in the area consists of sagebrush, various grasses and forbs, and desert shrubs. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel contains riparian habitat and slopes greater than 25 percent, but does not have occupied dwellings. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic

overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. The parcel also contains riparian areas that are highly productive. These soils are generally comprised of silty clays with a gravel or rock component. The soils are stable and have a low erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-116 (The parcel is in KFO and would be available to be offered for lease under Alternatives B and C): The parcels is federal land administered by BLM. The parcel is in VRM Class IV. The parcel is within a Greater sage-grouse key habitat area, but does not meet the IM WY-2010-013 manageability criteria. The parcel has Greater sage-grouse breeding and nesting habitat, and raptor nesting habitat, as well as crucial big game winter range. It also provides potential habitat for Idaho pocket gopher, pygmy rabbit, Dorn's twinpod, large-fruited bladderpod, prostrate bladderpod, tufted twinpod and is in the Cumberland/Uinta grazing allotment. Vegetation in the area consists of sagebrush, various grasses and forbs, and juniper woodlands. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel does not contain riparian habitat or occupied dwellings, but does have slopes greater than 25 percent. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-117 (The parcel is available to be offered for lease under Alternatives B and C): Section 2 of parcel 117 is split estate (private surface/federal minerals, where as Section 4 is federal land administered by BLM. The parcel is in VRM Class IV. The parcel is not in a Greater sage-grouse key habitat area. It also provides potential habitat for Idaho pocket gopher, pygmy rabbit, Dorn's twinpod, prostrate bladderpod, tufted twinpod and is in the Cumberland/Uinta grazing allotment. Vegetation in the area consists of sagebrush, various grasses and forbs, and juniper woodlands. Section 2 of the parcel lies within the Colorado River watershed; whereas Section 4 is in the Bear River watershed. Both watersheds are subject to water depletion restrictions to protect threatened or endangered fish species occurring in the rivers proper. The parcel does not contain riparian habitat but does have slopes greater than 25 percent and the split estate portion of the parcel has the potential for occupied dwellings. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-118 (The parcel is in KFO and is available to be offered for lease under Alternatives B and C): The parcel is federal land administered by BLM and is in VRM Class IV. The parcel is not in a Greater sage-grouse key habitat area. The parcel has raptor nesting habitat. It also provides potential habitat for Idaho pocket gopher, pygmy rabbit, Dorn's twinpod, prostrate bladderpod, large-fruited bladderpod, tufted twinpod and is in the Cumberland/Uinta grazing allotment. Vegetation in the area consists of sagebrush, various grasses and forbs, and juniper woodlands. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel does not contain riparian habitat or occupied dwellings, but does have slopes greater than 25 percent. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-119 (The parcel is in KFO and would be available to be offered for lease under Alternatives B and C): The parcel is federal land administered by BLM and is in VRM Class IV. The parcel is in a Greater sage-grouse key habitat area, but does not meet the IM WY-2010-013 manageability criteria. It provides potential habitat for Idaho pocket gopher, Greater sage-grouse, pygmy rabbit, Dorn's twinpod, prostrate bladderpod, large-fruited bladderpod, tufted twinpod and is in the Cumberland/Uinta grazing allotment. Vegetation in the area consists of sagebrush, various grasses and forbs, and juniper woodlands. The parcel lies within the Colorado River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel contains riparian habitat and slopes greater than 25 percent but does not have occupied dwellings. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. The parcel also contains riparian areas that are highly productive. These soils are generally comprised of silty clays with a gravel or rock component. The soils are stable and have a low erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-120 (The parcel is in KFO and would be available to be offered for lease under Alternatives B and C): The parcel is federal land administered by BLM and is in VRM Class II and IV. The parcel is not in a Greater sage-grouse key habitat area. The parcel has crucial big game winter range and has bald eagle nesting/roosting habitat, Greater sage-grouse and raptor nesting habitat. It also provides potential habitat for Idaho pocket gopher, pygmy rabbit, white-faced ibis, Dorn's twinpod, prostrate bladderpod, Trelease's milkvetch, large-fruited bladderpod, tufted twinpod and is in the Cumberland/Uinta grazing allotment. Vegetation in the area consists of sagebrush, various grasses and forbs, and juniper woodlands. The parcel lies within the Bear River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel contains slopes greater than 25 percent, but

does not have occupied dwellings. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. The parcel also contains riparian areas that are highly productive. These soils are generally comprised of silty clays with a gravel or rock component. The soils are stable and have a low erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-121 (The parcel is in KFO and would be available to be offered for lease under Alternatives B and C): The parcel is federal land administered by BLM and is in VRM Class II and IV. The parcel is not in a Greater sage-grouse key habitat area. The parcel has crucial big game winter range and has raptor nesting habitat. It also provides potential habitat for bald eagle, white-faced ibis, Idaho pocket gopher, and pygmy rabbit and is in the Cumberland/Uinta grazing allotment. Vegetation in the area consists of sagebrush, various grasses and forbs, and juniper woodlands. The parcel lies within the Bear River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel does not contain riparian habitat or occupied dwellings, but does have slopes greater than 25 percent. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower areas have an increased salinity potential. The parcel also contains riparian areas that are highly productive. These soils are generally comprised of silty clays with a gravel or rock component. The soils are stable and have a low erosion potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-122 (The parcel is in KFO and would be available to be offered for lease under Alternatives B and C): A portion of the parcel is split estate (private surface and federal minerals), the rest is federal land administered by BLM and is in VRM Class II and IV. The parcel is not in a Greater sage-grouse key habitat area. The parcel has bald eagle, Greater sage-grouse, and raptor nesting habitat, as well as Greater sage-grouse breeding and mountain plover habitat. It also provides potential habitat for Idaho pocket gopher, pygmy rabbit, prostrate bladderpod, tufted twinpod and is in the Thomas Canyon, Wasatch, and Glasscock Hollow grazing allotments. Vegetation in the area consists of sagebrush, various grasses and forbs, and juniper woodlands. The parcel lies within the Bear River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel does not contain riparian habitat, but does have slopes greater than 25 percent. The split estate surface has the potential for occupied dwellings. Dominant parent materials include residuum formed over sediments; colluvium, including landslide and earth-flow deposits; and alluvium on slopes and drainages. Geologic overthrusting and the resulting mixed exposures have produced variable soil textures and complex soil/geomorphic relationships. In the narrow valleys and drainages, very deep and well-drained reddish and brown soils are common. The upland ridges are characterized by soils of varying depths. Lower

areas have an increased salinity potential. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-123 (The parcel is in KFO and would be available to be offered for lease under Alternatives B and C): The parcel is federal land administered by BLM and is in VRM Class IV. The parcel is not in a Greater sage-grouse key habitat area. The parcel has bald eagle, Greater sage-grouse, and raptor nesting habitat, as well as Greater sage-grouse breeding and mountain plover habitat. It also provides potential habitat for Idaho pocket gopher, pygmy rabbit, prostrate bladderpod, tufted twinpod and is in the Thomas Canyon and Wasatch grazing allotments. Vegetation in the area consists of sagebrush, various grasses and forbs, and juniper woodlands. The parcel lies within the Bear River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel does not contain riparian habitat, occupied dwellings, or slopes greater than 25 percent. Parent materials for the soils in the parcel area include sedimentary rock and glacial till, resulting in soils of various textures with various rock sizes within the soil profile. Mass wasting in the form of landslides and slumping occurs on the steeper, moister slopes. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-124 (The parcel is in KFO and would available to be offered for lease under Alternatives B and C): A portion of the parcel is split estate (private surface and federal minerals); the remainder is federal land administered by BLM and is in VRM Class IV. The parcel is not in a Greater sage-grouse key habitat area. The parcel has Greater sage-grouse nesting habitat. It also provides potential habitat for Idaho pocket gopher, pygmy rabbit, prostrate bladderpod, tufted twinpod and is in the Cook and Sims Canyon grazing allotments. Vegetation in the area consists of sagebrush, various grasses and forbs, and juniper woodlands. The parcel lies within the Bear River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel does not contain riparian habitat, but does have slopes greater than 25 percent and potentially has occupied dwellings. Parent materials for the soils in the parcel area include sedimentary rock and glacial till, resulting in soils of various textures with various rock sizes within the soil profile. Mass wasting in the form of landslides and slumping occurs on the steeper, moister slopes. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

WY-1111-125 (The parcel is in KFO and would be available to be offered for lease under Alternatives B and C): The parcel is federal land administered by BLM and is in VRM Class IV. The parcel is not in a Greater sage-grouse key habitat area. The parcel has crucial big game winter range and has mountain plover habitat. It also provides potential habitat for Idaho pocket gopher, pygmy rabbit, tufted twinpod and is in the Border grazing allotment. Vegetation in the area consists of sagebrush and various grasses and forbs. The parcel lies within the Bear River watershed and is subject to water depletion restrictions to protect threatened or endangered fish species occurring in the river proper. The parcel does not contain riparian habitat, occupied dwellings, or slopes greater than 25 percent. Parent materials for the soils in the parcel area include sedimentary rock and glacial till, resulting in soils of various textures with various rock sizes within the soil profile. Mass wasting in the form of landslides and slumping occurs on the steeper, moister slopes. Refer to Appendices C, D, and E for Greater sage-grouse key habitat area, wilderness characteristics, and MLP determinations.

3.2.3 Resources Common to all of the Parcels

3.2.3.1 Air Resources:

In addition to the air quality information in the RMPs cited above, new information about greenhouse gases (GHGs) and their effects on national and global climate conditions has emerged since the RMPs were prepared. Ongoing scientific research has identified the potential impacts of GHG emissions such as carbon dioxide (CO2) methane (CH4); nitrous oxide (N2O); water vapor; and several trace gasses on global climate. Through complex interactions on a global scale, GHG emissions cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and burning of fossil carbon sources have caused GHG concentrations to increase measurably, and may contribute to overall climatic changes, typically referred to as global warming.

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

Air quality, climate, and visibility are the components of air resources which include applications, activities, and management of the air resource. BLM must consider and analyze the potential effects of authorized activities on air resources as part of the planning and decision making process. The Kemmerer, Pinedale, Rawlins, and Green River RMP's all address quality issues, impacts, and potential mitigation. It is important to reiterate the offering and issuing leases is an administrative action, and the offering and the issuing of leases, in and of themselves, does not create air quality impacts.

3.2.2.1.1 Air Quality

Regional air quality is influenced by the interaction of meteorology, climate, the magnitude and spatial distribution of local and regional air pollutant sources, and the chemical properties of emitted air pollutants. The following sections summarize the existing climate and air quality within the area potentially affected by the parcels under consideration for leasing.

A variety of pollutants can affect air quality; these pollutants and their effects on health, visibility, and ecology are described in the following sections, along with data on existing air quality conditions found within the Kemmerer, Pinedale, Rawlins, and Rock Springs Field Office areas.

Monitoring and enforcement air quality standards is administered by the Wyoming Department of Environmental Quality-Air Quality Division (WDEQ-AQD). Wyoming Ambient Air Quality Standards (WAAQS) and National Ambient Air Quality Standards (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 (CAA). Currently, the WDEQ-AQD does not have regulations regarding greenhouse gas emissions, although these emissions are regulated indirectly by various other regulations.

Concentrations:
Pollutant concentration can be defined as the mass of pollutant present in a volume of air and is reported in units of micrograms per cubic meter ($\mu g/m^3$), parts per million (ppm), or parts per billion (ppb). The State of Wyoming has used monitoring and modeling to determine that the Rock Springs, Rawlins and Kemmerer Field Office areas are currently in compliance with Wyoming and federal concentration standards; whereas the Pinedale Field Office has experienced exceedances of the ozone standard. In addition, non-reference method monitoring systems are operational, including the *Clean Air Status and Trends Network* (CASTNet) and *Wyoming Air Resources Monitoring System* (WARMS). Data from these systems have been determined to be representative of the area. There are two monitoring sites within the Kemmerer Field Office; four within the Pinedale FO; two in the Rock Springs FO; and two in the Rawlins FO.

Criteria air pollutants are those for which national concentration standards have been established; pollutant concentrations greater than the established standards represent a risk to human health or welfare. Table 3.2.1.1 presents background concentrations of criteria air pollutants as determined by the WDEQ-AQD.

Background concentrations are in compliance with applicable Wyoming and national ambient air quality standards (WAAQS/NAAQS). Also included in Table 3.2.1.1 are Prevention of Significant Deterioration (PSD) increments for Class I areas (wilderness areas with protected air quality status due to their pristine condition) and Class II areas (wilderness areas with protected air quality status due to their sensitive condition). All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD Increment Consumption Analysis. NAAQS/WAAQS have been established for the following criteria pollutants:

Carbon monoxide (CO) is an odorless, colorless gas formed during combustion of any carbon-based fuel, such as during operation of engines, fireplaces, furnaces, etc. Because carbon monoxide data are generally collected only in urban areas where automobile traffic levels are high, recent data are often unavailable for rural areas. Background carbon monoxide data were collected in Ryckman Creek (BLM 1983) in southwest Wyoming and in Rifle and Mack, Colorado during the late 1970s and the early 1980s. These are the most representative available data for the Project Area. Background carbon monoxide concentrations were 5.6–14% of the applicable WAAQS (Table 3.2.1.1)

Nitrogen dioxide (NO_2) is a highly reactive compound formed at high temperatures during operation of fossil fuel combustion. At high concentrations, it can form a red-brown gas. At concentrations in excess of the EPA air quality standard, it is a respiratory irritant; however, all areas of the United States are in compliance with this air quality standard. During fossil fuel combustion, NO is released into the air which reacts in the atmosphere to form NO_2. NO plus NO_2 is a mixture of nitrogen gases, collectively called nitrogen oxides (NO_x). NO_x emissions can convert to ammonium nitrate particles and nitric acid which can cause visibility impairment and atmospheric deposition. Nitrogen dioxide can contribute to “brown cloud” conditions and ozone formation, and can convert to ammonium (NH_4), nitrate particles (NO_3), and nitric acid (HNO_3). Internal combustion engines are one source of NO_x. However, coal fired power plants often have the highest NO_x emissions although any combustion source will produce NO_x. Figure 3.1 shows mean annual concentrations of nitrogen compounds at the Pinedale CASTNet site

from 1989 through 2004. Nitrogen dioxide data were collected in Green River, Wyoming, from January 2001 to December 2001. Background concentrations of nitrogen dioxide were 3.4% of the applicable WAAQS (Table 3.2.1.1).

Ozone (O_3) is a faint blue gas that is generally not emitted directly into the atmosphere but is formed in the atmosphere from complex photochemical reactions involving NO_2 and volatile reactive organic compounds (VOC). Sources of VOCs include automotive emissions, paint, varnish, oil and gas operations and some types of vegetation. The faint acrid smell common after thunderstorms is caused by ozone formation by lightning. O_3 is a strong oxidizing chemical that can burn lungs and eyes, and damage plants. Ozone is a severe respiratory irritant at concentrations in excess of the federal standards. On January 6, 2010, EPA proposed that the primary ozone standard be set between 0.060 and 0.070 ppm. Sublette County within the Pinedale Field Office has had exceedances of the current ozone standard on different occasions over past 4 years, which has resulted in the Governor of Wyoming nominating Sublette County as a non-attainment area.

Table 3.2.1.1: Air Pollutant Background Concentrations, NAAQS/WAAQS and Prevention of Significant Deterioration (PSD) Increments (µg/m^3).

Pollutant/Averaging Time	Background Concentration (µg/m^3)	NAAQS and WAAQS (µg/m^3)	Percent of NAAQS and WAQQS	Incremental Increase Above Legal Baseline[a]	
				PSD Class I	PSD Class II
CO					
1-hour	3,336[†] 2,229[††]	40,000	8.3%[†] 5.6%[††]	n/a	n/a
8-hour	1,381[†] 1,148[††]	10,000	13.8%[†] 11.5%[††]	n/a	n/a
NO_2[‡]					
Annual	3.4	100	3.4%	2.5	25
(O_3)[€]					
8-hour	147	157	93.6%		
PM_{10}[i]					
24-hour	48	150	32.0%	8	30
Annual	25	50-WAAQS	50.0%	4	17
$PM_{2.5}$[i]					
24-hour	15	35-NAAQS 65-WAAQS	42.9% 23.1%	n/a	n/a
Annual	7.8	15	52.0%	n/a	n/a
(SO_2)[ii]					
3-hour	29	1,300	2.2%	25	512
24-hour (National)	43	365	11.8%	5	91
24-hour(Wyoming)	18	260	6.9%	5	91
Annual (National)	9	80	11.3%	2	20
Annual (Wyoming)	5	60	8.3%	2	20

n/a = not applicable, PSD = prevention of significant deterioration.
a All NEPA analysis comparisons to the PSD increments are indented to evaluate a threshold of concern and do not represent a regulatory PSD Increment Consumption Analysis.
† Background data collected by Amoco at Ryckman Creek for an 8-month period during 1978–1979, summarized for the Riley Ridge Project (BLM 1983)
†† Background data collected at Rifle and Mack, Colorado in conjunction with proposed oil shale development during the early 1980's.
‡ Background data collected at Green River Basin Visibility Study site, Green River, Wyoming, during the period January–December 2001 (Air Resource Specialists 2002).
€ Background data collected at Green River Basin Visibility Study site, Green River, Wyoming, during the period June 10, 1998, through December 31, 2001 (Air Resource Specialists 2002).
I Background data for PM10 collected by Wyoming Department of Environmental Quality/Air Quality Division (WDEQ/AQD) at Rock Springs, Wyoming, in 2005. PM2.5 based on a 1:3.2 PM2.5:PM10 ratio based on three full years of PM10 data (1997-1999) collected in Rock Springs as part of the Green River Basin Visibility Study. These data have been determined by WDEQ/AQD to be the most representative data available.
ii Background data for Wyoming (3 hour, 24 hour and annual) collected at the Craig Power Plant site and oil shale areas 1980-1984

Figure 3.2.1.1: Mean Annual Concentrations of Nitrogen Compounds near Pinedale, Wyoming. Concentrations typical in remote areas are: HNO_3 = 0.3 ppb, NO_3 = 0.2 ppb, NH_4 = 0.3 ppb. Data taken from CASTNET Pinedale Station PND165.

In March 2008 the U.S. Environmental Protection Agency (EPA) promulgated the current National Ambient Air Quality Standard (NAAQS) for ozone. The ozone standard was lowered from 0.08 parts per million (ppm) to 0.075 ppm based on the fourth highest 8-hour average value per year at a site, averaged over three years. Based on monitoring results from 2006 through 2008, the entire state of Wyoming is in compliance with this standard except for at a single monitor, the Boulder monitor, in Sublette County. The WDEQ-AQD evaluated whether a nonattainment area should be designated due to the monitored results at the Boulder monitor. The WDEQ-AQD recommended that the Upper Green River Basin (UGRB) be designated as nonattainment for the 2008 ozone National Ambient Air Quality Standard (NAAQS). The WDEQ-AQD based this recommendation on a careful review of the circumstances surrounding the incidence of elevated ozone events. Elevated ozone in the UGRB is associated with distinct meteorological conditions. These conditions have occurred in February and March in some (but not all) of the years since monitoring stations began operation in the UGRB in 2005. The UGRB does not include any lands within the Rawlins or Kemmerer Field Offices, but does include a portion of the Rock Springs Field Office and most of the Pinedale Field Office.

Ozone data were collected in Green River, Wyoming, from 1998 to 2001 and show background concentrations of ozone to be 93.6% of the applicable WAAQS (Table 3.2.1.1). Additional ozone monitoring at the Pinedale CASTNet site shows that concentrations of ozone there are typical of remote areas.

Particulate matter (PM) refers to the small particles (i.e., soil particles, pollen, etc.) suspended in the air that settle to the ground slowly and may be re-suspended if disturbed. Ambient air particulate matter standards are based on the size of the particle. The two types of particulate matter are:

- PM_{10} (particles with diameters less than 10 micrometers): small enough to be inhaled and capable of causing adverse health effects.
- $PM_{2.5}$ (particles with diameters less than 2.5 micrometers): small enough to be drawn deeply into the lungs and cause serious health problems. These particles are also the main cause of visibility impairment.

Background concentrations of PM10 are 32-50% of the applicable WAAQS (Table 3.2.1.1). Other regulatory monitoring of particulate matter showed that concentrations were in compliance with applicable WAAQS.

The WDEQ-AQD monitors particulate matter throughout the State of Wyoming with the State and Local Air Monitoring System (SLAMS). Table 3.2.1.2 summarizes particulate matter concentrations in Wyoming during 2001. Annual PM_{10} background concentrations for the MAA exceed the statewide average, while MAA $PM_{2.5}$ concentrations fall below the statewide average.

Table 3.2.1.2: Wyoming Particulate Summary for 2001 (µg/m3).

Pollutant	Annual Background for MAA	Annual Statewide Average
PM_{10}	33	22
$PM_{2.5}$	5	8

Sulfur dioxide (SO_2) and sulfates (SO_4) form during combustion from trace levels of sulfur in coal or diesel fuel. Sulfur dioxide also participates in chemical reactions and can form sulfates and sulfuric acid in the atmosphere. Background concentrations of sulfur dioxide are 2–12% of the applicable WAAQS (Table 3.2.1.1).

Sulfur dioxide concentrations typically range from 1 to 10 ppb (2.6 to 26 $\mu g/m^3$) in remote areas, and from 20 to 200 ppb (52 to 520 $\mu g/m^3$) in polluted areas (Seinfeld 1986). Average weekly concentrations of sulfur dioxide at the Pinedale CASTNet site are 0.3 ppb (0.8 $\mu g/m^3$) and are typical of remote or unpolluted areas.

Mean annual sulfate concentrations are typically 0.6 ppb (2.5 $\mu g/m^3$) or less in remote areas, and 2.5 ppb (10 $\mu g/m^3$) or more in urban areas (Stern et al. 1973). Mean annual concentrations of sulfate are 0.5 ppb (2 $\mu g/m^3$) at the Pinedale CASTNet site and are typical of remote or unpolluted areas.

3.2.2.1.2 Climate and Climate Change

The Kemmerer, Pinedale, Rock Springs and Rawlins Field Offices are located in a semi-arid, mid-continental climate regime typified by dry, windy conditions, limited rainfall, and long, cold winters (Trewatha and Horn 1980). Table 3.2.1.3 summarizes potentially affected climate components in the area based on data collected at several long-term meteorological stations located in and near the Kemmerer, Pinedale, Rock Springs and Rawlins Field Office areas.

Table 3.2.1.3: Summary of Climate (1958–2005).	
Wyoming Meteorological Station	**Description**
Kemmerer Water Treatment Station	Mean annual temperature: 39.3 °F Mean annual precipitation: 9.78 inches Mean annual snow depth: 2 inches Mean annual snowfall: 50.9 inches
Rock Springs	Mean annual temperature: 44.1 °F Mean annual precipitation: 8.51 inches Mean annual snow depth: 1 inch Mean annual snowfall: 49.2 inches
LaBarge	Mean annual temperature: 39 °F Mean annual precipitation: 8.03 inches Mean annual snow depth: 1 inch Mean annual snowfall: 31.7 inches
Rawlins	Mean annual temperature: 43.0 °F Mean annual precipitation: 9.00 inches Mean annual snow depth: 2 inches Mean annual snowfall: 51.6 inches
Source: (Western Regional Climate Center 2006)	

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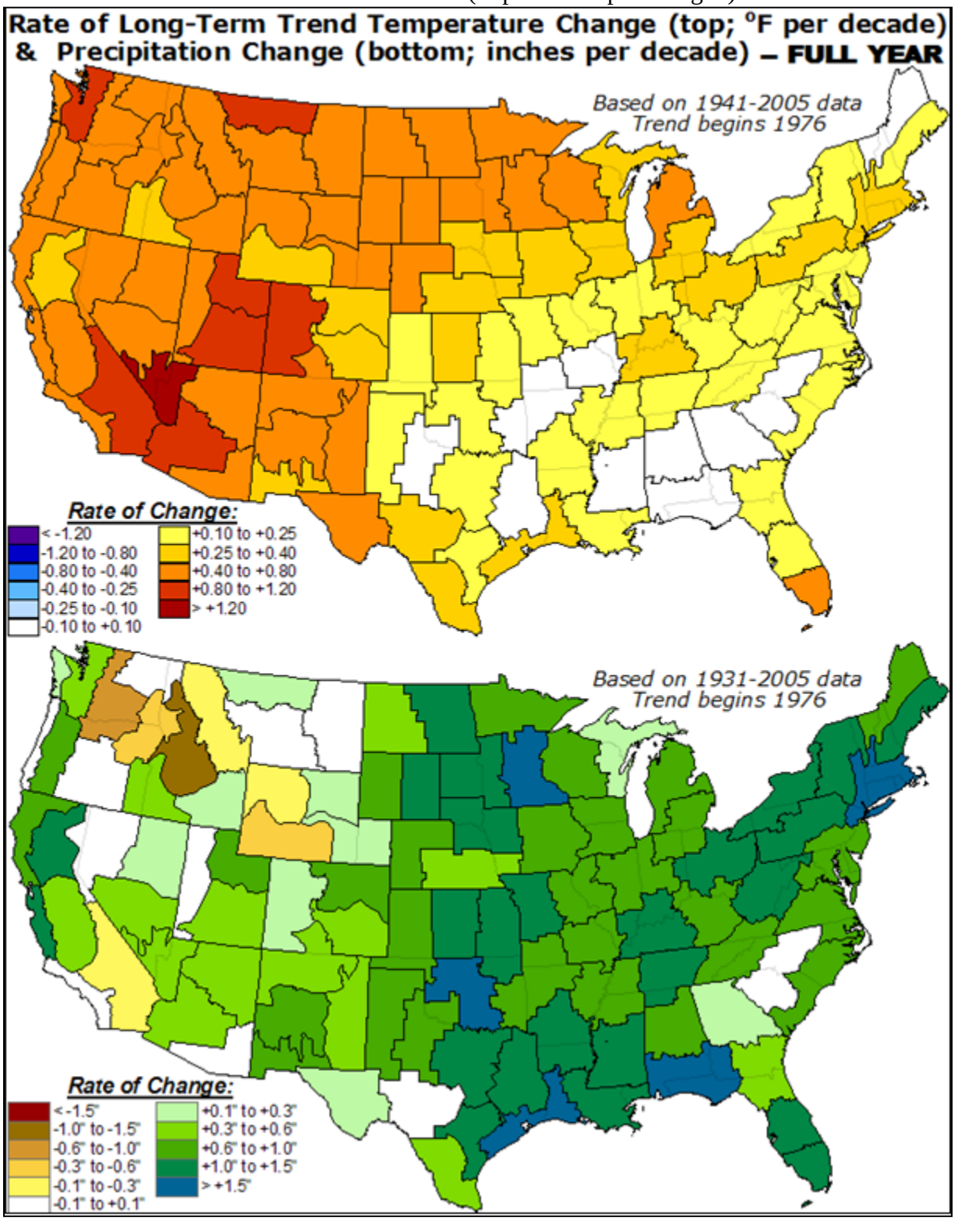
The region is subject to strong, gusty winds that are often accompanied by snow and blizzard conditions during the winter. Winds frequently originate from the west to northwest, and the mean annual wind speed is 9 miles per hour.

Wind strength and frequency affects dispersion of noises, odors, and transport of dust and other airborne elements. Therefore, the region's strong winds increase the potential for atmospheric dispersion of pollutants.

Climate change refers to any significant change in measures of climate (e.g., temperature or precipitation) lasting for an extended period (decades or longer). Global mean surface temperatures have increased nearly 1.8°F from 1890 to 2006. Models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Northern latitudes (above 24°N) have exhibited temperature increases of nearly 2.1° F since 1900, with nearly a 1.8°F increase since 1970 alone. Temperature in western Wyoming is expected to increase by 0.25 to 0.40 degrees Fahrenheit per decade while temperatures in surrounding locations in Utah, Wyoming, and Colorado are expected to increase by 0.40 to 1.2 degrees Fahrenheit per decade with the largest decrease expected in southwestern Wyoming (Figure 3.2.1.2). Precipitation across western Wyoming is expected to decrease by 0.1 to 0.6 inches per decade with the largest decrease expected in southwestern Wyoming (Figure 3.2.1.2).

Figure 3.2.1.2: Long-term Temperature (top) and Precipitation (bottom) Trends in the United States from NOAA Climate Prediction Center (http://www.cpc.noaa.gov).



Climate change may result from natural processes, such as changes in the sun's intensity; natural processes within the climate system (such as changes in ocean circulation); human activities that

change the atmosphere's composition (such as burning fossil fuels) and the land surface (such as urbanization) (IPCC 2007). Several activities that occur in the Kemmerer, Pinedale, Rock Springs and Rawlins Field Office areas contribute to the phenomena of climate change, including large wildfires and activities using combustion engines; changes to the natural carbon cycle; changes to radioactive forces and reflectivity (albedo); and emissions of greenhouse gases (GHGs), especially carbon dioxide and methane, from fossil fuel development.

Greenhouse gases are composed of molecules that absorb and reradiate infrared electromagnetic radiation. When present in the atmosphere the gas contributes to the greenhouse effect. Some GHGs such as carbon dioxide occur naturally and are emitted to the atmosphere through 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. Fluorinated gases are powerful GHGs that are emitted from a variety of industrial processes including production of refrigeration/cooling systems, foams and aerosols. Fluorinated gases are not primary to the activities authorized by the BLM and will not be discussed further in this document.

The Center for Climate Strategies (CCS) 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 (WRAP). This inventory report presents a preliminary draft greenhouse gas (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 *gross1* carbon dioxide equivalent (CO2e) emissions in 2005, an amount equal to 0.8% of total US 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 MMtCO2e in 2005. Wyoming's per capita emission rate is more than four times greater than the national average of 25 MtCO2e/yr. This large difference between national and state per capita emissions occurs in most of the sectors – Wyoming's emission per capita significantly exceed national emissions per capita for the following sectors: electricity, industrial, fossil fuel production, transportation, industrial process and agriculture. The reasons for the higher per capita intensity in Wyoming are varied but include the state's strong fossil fuel production industry and other industries with high fossil fuel consumption intensity, large agriculture industry, large distances, and low population base. Between 1990 and 2005, per capita emissions in Wyoming have increased, mostly due to increased activity in the fossil fuel industry, while national per capita emissions have changed relatively little.

Ongoing scientific research has identified the potential impacts of anthropogenic GHG emissions and changes in biological sequestration due to land management activities on global climate. Through complex interactions on a regional and global scale, these GHG emissions and net

losses of biological carbon sinks 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, recent industrialization and burning of fossil carbon sources have caused carbon dioxide equivalent (CO2e) concentrations to increase dramatically, and are likely to contribute to overall global climatic changes. The Intergovernmental Panel on Climate Change (IPCC) recently concluded that "warming of the climate system is unequivocal" and "most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations" (IPCC 2007.)

It is important to note that GHGs will have a sustained climatic impact over different temporal scales. For example, recent emissions of carbon dioxide can influence climate for 100 years. In contrast, black carbon is a relatively short-lived pollutant, as it remains in the atmosphere for only about a week. It is estimated that black carbon is the second greatest contributor to global climate change behind CO_2 (Ramanathan and Carmichael, 2008). Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHGs are likely to accelerate the rate of climate change.

Some authorized activities within the Kemmerer, Pinedale, Rock Springs and Rawlins Field Offices generate GHG emissions. Oil and gas development activities can generate CO2 and NH4 (during processing). Carbon dioxide emissions result from the use of combustion engines for OHV and other recreational activities. Wildland fires also are a source of CO2 and other GHG emissions, and livestock grazing is a potential source of methane. Other activities in the Kemmerer, Pinedale, Rock Springs and Rawlins Field Office area with the potential to contribute to climate change include soil erosion from disturbed areas and fugitive dust from roads, which have the potential to darken snow-covered surfaces and cause faster snow melt. A description of the potential GHG emissions associated with the parcels proposed for leasing is included in Section 4.

3.2.2.1.3 Visibility

The 1997 CAA amendments declared "as a National Goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas in which impairment results from manmade air pollution." The CAA gives federal managers the affirmative responsibility, but no regulatory authority, to protect air quality-related values, including visibility, from degradation.

PSD increments limit air quality degradation and ensure that areas with clean air continue to meet NAAQS, even during economic development. The PSD program goal is to maintain pristine air quality required to protect public health and welfare from air pollution effects and "to preserve, protect and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreation, scenic or historic value."

PSD increments have been established for NO_2, SO_2, and PM_{10}. Comparisons of potential PM_{10}, NO_2, and SO_2 concentrations with PSD increments are intended only to evaluate a threshold of concern. The allowable PSD increment depends on an area's classification. Class I areas have lower increments, due to their protected status as pristine areas. PSD Class I and other sensitive

Table 3.2.1.4: Distances and Direction to Class I Areas.								
Class I Area	**Dist. From KFO (km)**	**Direction From KFO**	**Dist. From RFO (km)**	**Direction From RFO**	**Dist. From PFO (km)**	**Direction From PFO**	**Dist. From RSFO (km)**	**Direction From RSFO**
Bridger Wilderness Area	>50 <100	North	>200 <250	Northwest	<50	East	>50 <100	North
Fitzpatrick Wilderness Area	>100 <150	North	>200 <250	Northwest	<50	East	>50 <100	North
Grand Teton National Park	>150 <200	North	>400 <450	Northwest	>50 <100	Northwest	>100 <150	Northwest
Mount Zirkel Wilderness Area	>250 <300	East	>100 <150	Southeast	>200 <250	Southeast	>150 <200	Southeast
Savage Run/Platte River Wilderness Area	>200 <250	Southeast	>50 <100	Southeast	>150 <200	Southeast	>100 <150	Southeast
Teton Wilderness Area	>100 <150	North	>400 <450	Northwest	>50 <100	Northwest	>100 <150	Northwest
Washakie Wilderness Area	> 150 <200	North	>300 <350	North	>100 <150	North	>250 <300	North

Table 3.2.1.5: Distances and Direction to Class II Sensitive Areas and other areas of concern in southern Wyoming.								
Sensitive Class II Areas	**Dist. From KFO (km)**	**Direction From KFO**	**Dist. From RFO (km)**	**Direction From RFO**	**Dist. From PFO (km)**	**Direction From PFO**	**Dist. From RSFO (km)**	**Direction From RSFO**
Fossil Butte National Monument	Within	N/A	>200 <250	West	>100 <150	Southwest	>100 <150	Northwest
Popo Agie Wilderness Area	108	Northeast	>150 <200	Northwest	>100 <150	East	>100 <150	North
Seedskadee National Wildlife Refuge	Adjoins	East	>200 <250	West	>50 >100	South	Adjoins	West
Cokeville Meadows National Wildlife Refuge	Within	N/A	>250 <300	West	>100 <150	Southwest	>150 <200	Northwest

areas located in close proximity to the Rawlins and Kemmerer Field Offices and the distance of each from the field office are shown on Map 3-1. Federal Class I areas are listed in Table 3.2.1.4. Several additional areas are classified as PSD Class II, where lower incremental air quality limits are imposed due to less pristine background air quality. PSD Class II areas are listed in Table 3.2.1.5.

A wide variety of pollutants can impact visibility, including particulate matter, nitrogen dioxide, nitrates (compounds containing NO_3), and sulfates (compounds containing SO_4). Fine particles suspended in the atmosphere decrease visibility by blocking, reflecting, or absorbing light.

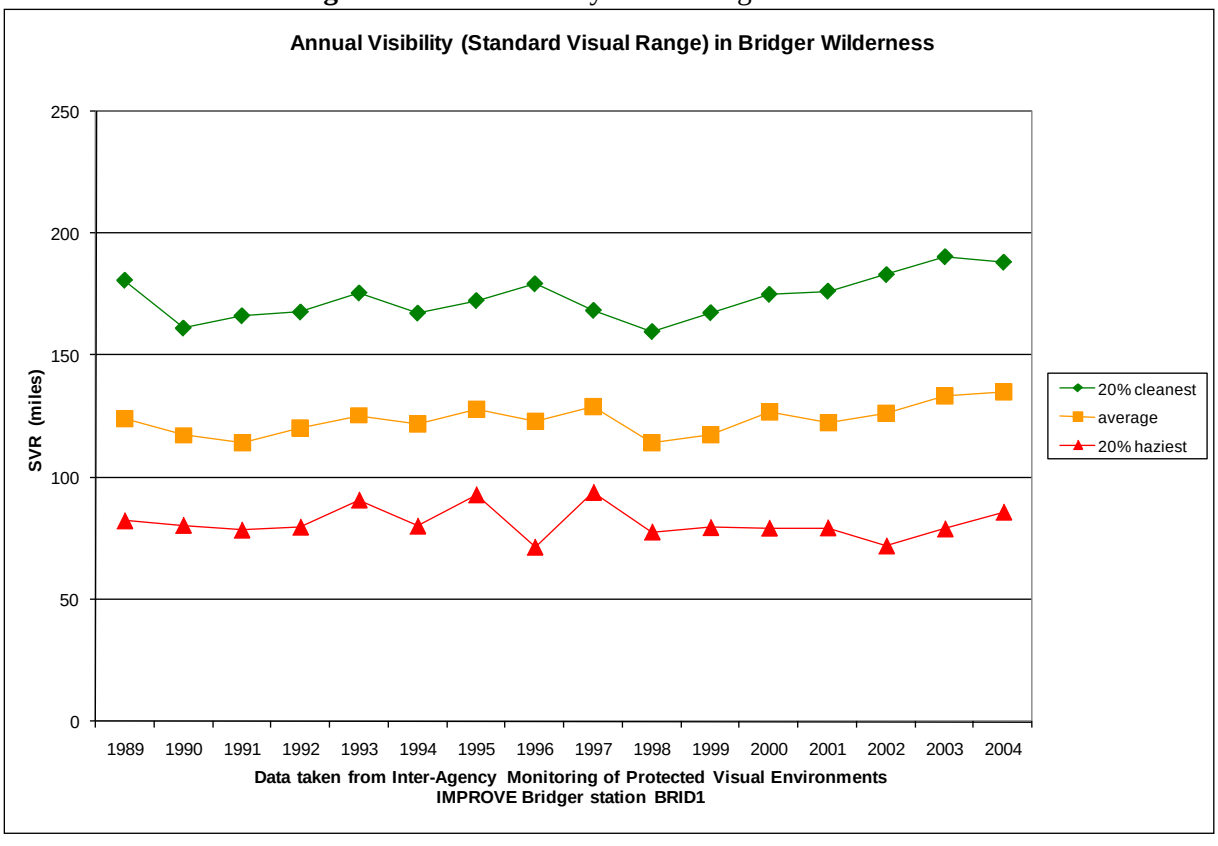
Two types of visible impairment can be caused by emission sources: plume impairment and regional haze. Plume impairment occurs when a section of the atmosphere becomes visible due to the contrast or color difference between a discrete pollutant plume and a viewed background, such as a landscape feature. Regional haze occurs when pollutants from widespread emission sources become mixed in the atmosphere and travel long distances.

Visibility is quantified in terms of the deciview (dv), which is defined as a change in visibility that is perceptible to the average human, and in terms of the standard visible range (SVR), which is defined as the distance that an average human can see. Visibility data are calculated for each day, ranked from cleanest to haziest, and reported into three categories:

- 20% cleanest: mean visibility for the 20% of days with the best visibility
- Average: the annual mean visibility
- 20% haziest: mean visibility for the 20% of days with the poorest visibility

Visibility data were collected in the Bridger Wilderness from 1989 to 2003. The mean annual SVR varies from 198–162 miles (or 2–4 dv) on clear days, 133–109 miles (or 6–8 dv) on average days, and 12-10 miles (or 10–12 dv) on hazy days (Figure 3.2.1.3).

Figure 3.2.1.3: Visibility in the Bridger Wilderness.



Deposition:

Through a process called atmospheric deposition, air pollutants fall out of the atmosphere and are deposited on terrestrial and aquatic ecosystems. These pollutants are deposited via wet deposition (precipitation) and dry deposition (gravitational settling of particles and gaseous pollutants that adhere to soil, water, and vegetation). Substances deposited include:

- Acids, such as sulfuric acid and nitric acid (HNO_3) (referred to as "acid rain")
- Air toxins, such as pesticides, herbicides, and VOCs
- Nutrients, such as nitrate and ammonium (NH_4^+)

Deposition is reported as the mass of material deposited on an area (kilogram per hectare per year). Total deposition refers to the sum of airborne material transferred to the Earth's surface by both wet and dry deposition.

A brief summary of current atmospheric deposition in the region is included in Table 3.1.2.6. These data represent several locations in the region, including Pinedale, Gypsum Creek, and Yellowstone National Park.

The natural acidity of rainwater is represented by pH values ranging from 5.0 to 5.6 (Seinfeld 1986). Precipitation pH values lower than 5.0 are considered acidified and may adversely affect plants and animals. A voluntary level of concern for a decrease in pH levels in rainwater has been estimated to be 0.1–0.2 (U.S. Department of Agriculture 1989).

Table 3.2.1.6: Summary of Current Atmospheric Deposition.	
Deposition Component	**Description**
Precipitation pH	Precipitation pH demonstrates some acidification · Pinedale: 4.8–5.4 · Gypsum Creek: 5.0–5.4 · Yellowstone National Park: 5.2–5.6
Total nitrogen deposition	Total nitrogen deposition is less than levels of concern · Pinedale: 1.0–1.5 kg/ha-year
Total sulfur deposition	Total sulfur deposition is less than levels of concern · Pinedale: 1–2 kg/ha-year

Total deposition voluntary levels of concern have been estimated for several areas (U.S. Department of Agriculture 1989). Estimated total deposition guidelines include the "red line" (defined as the total deposition that the area can tolerate) and the "green line" (defined as the acceptable level of total deposition).

Total nitrogen deposition guidelines for the Bridger Wilderness include the red line (set at 10 kg/ha-year) and the green line (set at 3–5 kg/ha-year). Actual mean annual total nitrogen deposition ranged from below 1.5 kg/ha-year to above 3.5 kg/ha-year (Figure 3.1.2.4). Total sulfur depositions guidelines for include the green line (set at 5 kg/ha-year) and the red line (set at 20 kg/ka-year). Mean annual total sulfur deposition ranged from 1 kg/ha-year to nearly 3 kg/ha-year (Figure 3.1.2.5). For sulfur, the measured baseline deposition is well below the voluntary levels of concern (green line). For nitrogen, some deposition levels exceed the lower limits of the green line.

Figure 3.1.2.4: Mean Annual Nitrogen Deposition for Hobbs Lake and Black Joe Lake.

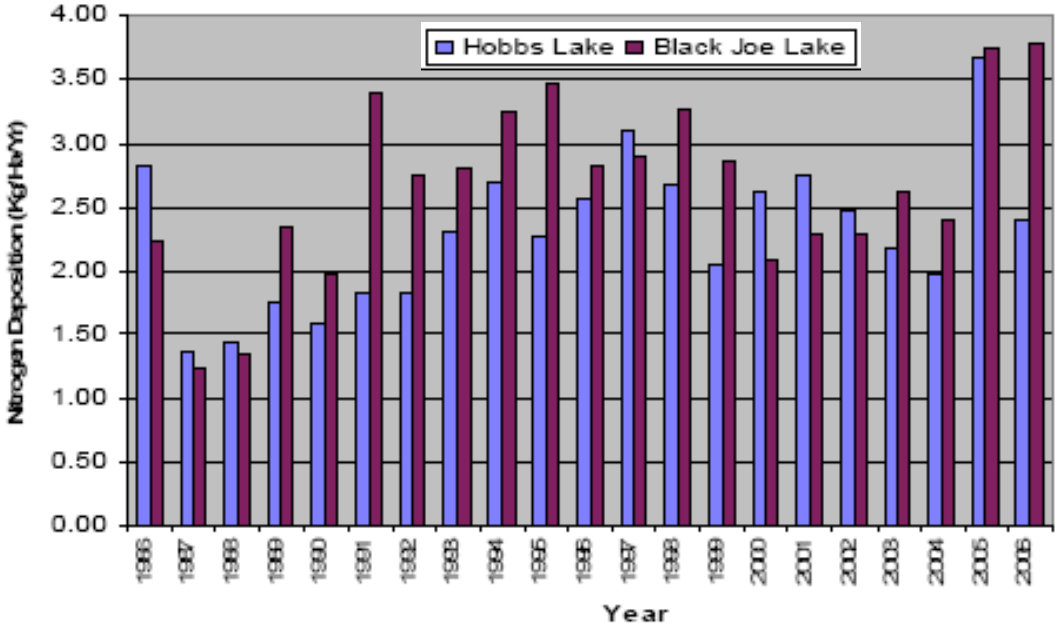
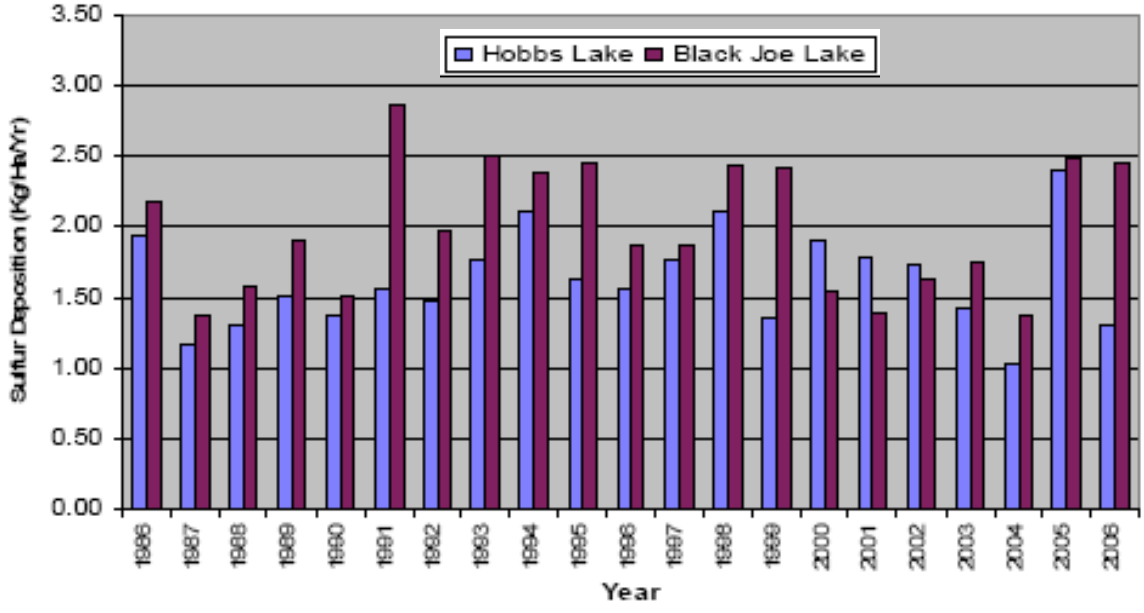


Figure 3.2.1.5: Mean Annual Sulfur Deposition for Hobbs Lake and Black Joe Lake.



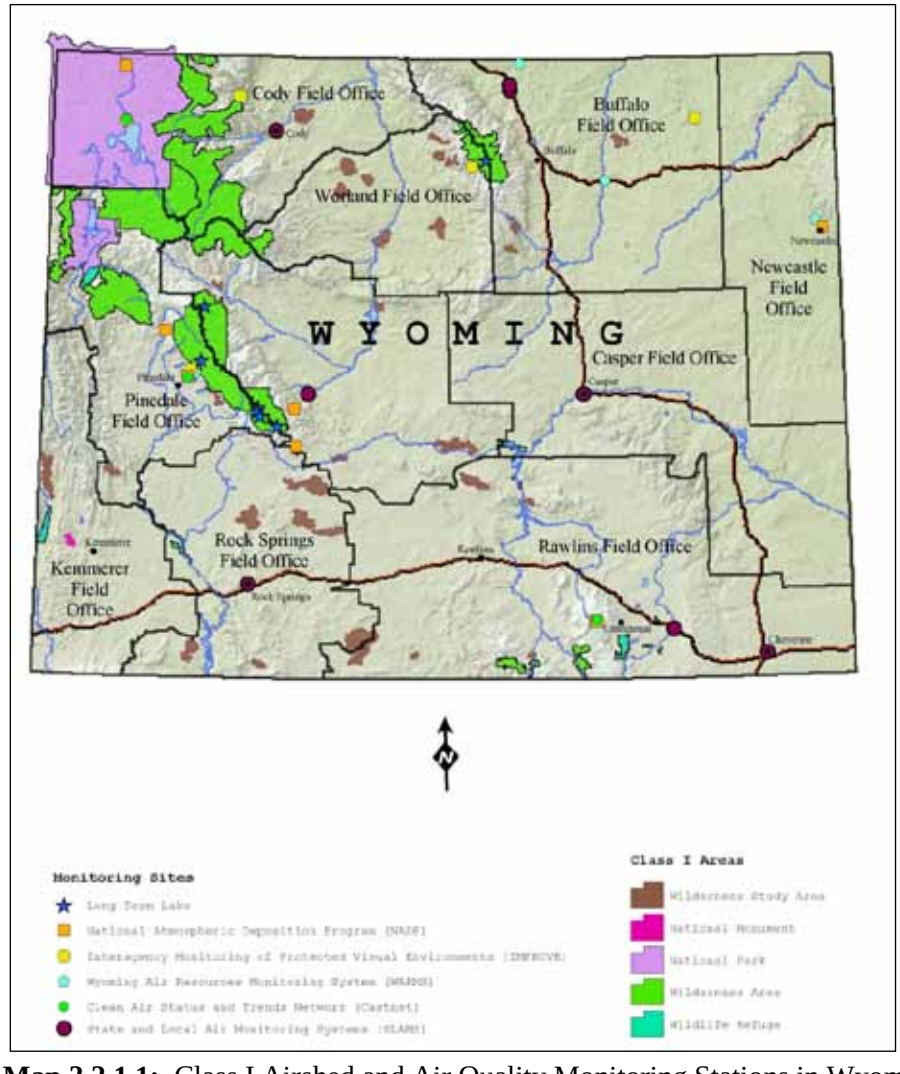
Atmospheric deposition of nitrogen and sulfur compounds can cause acidification of lakes and streams. One expression of lake acidification is a change in acid neutralizing capacity (ANC), which is a lake's ability to resist acidification from atmospheric deposition. ANC is expressed in units of micro-equivalents per liter (µeq/l). Lakes with ANC values of 25 to 100 µeq/l are considered to be sensitive to atmospheric deposition; lakes with ANC values of 10 to 25 µeq/l are considered to be very sensitive; and lakes with ANC values of less than 10 are considered to be extremely sensitive. Table 3.2.1.7 summarizes distances and direction from RFO and KFO to sensitive lakes in the region.

Table 3.2.1.7: Distance and Direction to Sensitive Lakes

Sensitive Lake Receptors	**Distance From KFO (km)**	**Direction from KFO**	**Distance From RFO (km)**	**Direction from RFO**
Black Joe Lake, Bridger Wilderness Area	142	North	182	Northwest
Deep Lake, Bridger Wilderness Area	139	North	180	Northwest
Upper Frozen Lake, Bridger Wilderness Area	137	North	175	Northwest
Ross Lake, Fitzpatrick Wilderness Area	194	North	250	Northwest
Lower Saddlebag Lake, Popo Agie Wilderness Area.	140	North	160	Northwest

Site-specific lake water chemistry background data (pH, ANC, total bulk deposition of nitrate, sulfate, etc.) have been collected by the USFS in several high mountain lakes in the nearby Wilderness Areas. Deposition data – total nitrogen and sulfur, nitrate and sulfate – from 1986 through 2006 are shown below.

Lake acidification is measured in terms of change in ANC, which is the lake's buffering capacity to resist acidification from atmospheric deposition of acid compounds such as sulfates and nitrates. Measured background ANC data for USFS identified sensitive lakes within the modeling domain are provided in Table 3.2.1.8. The 10th percentile lowest ANC values were calculated for each lake, following procedures provided by the USFS. The ANC values proposed for use in this analysis, and the number of samples used in the calculation of the 10th percentile lowest ANC values, are provided in Table 3.2.1.8.



Map 3.2.1.1: Class I Airshed and Air Quality Monitoring Stations in Wyoming.

Table 3.1.2.8: Background Acid Neutralizing Capacity Values for Acid Sensitive Lakes.				
Lake	**Wilderness Area**	**10th Percentile Lowest ANC Value (µeq/l)**	**Number of Samples**	**Sensitivity**
Black Joe	Bridger	67.1	67	Sensitive
Deep	Bridger	59.7	64	Sensitive
Upper Frozen	Bridger	6.0	8	Extremely Sensitive
Ross	Fitzpatrick	60.4	33	Sensitive
Lower Saddlebag	Popo Agie	54.2	32	Sensitive

The USFS considers lakes with ANC values greater than 25 microequivalents per liter (µeq/l) to be sensitive to atmospheric deposition and lakes with ANC values less than or equal to 25 µeq/l are considered extremely sensitive. Of the lakes for which data is presented in Table 3.1.2.8, Upper Frozen and Lazy Boy lakes are considered extremely acid sensitive.

The USFS has identified a specific methodology to determine acceptable changes in ANC, which are used to evaluate potential air quality impacts from deposition at acid sensitive lakes. The USFS has established a level of acceptable change (LAC) of no greater than a 1 µeq/l change in ANC (from human causes) for lakes with existing ANC levels less than or equal to 25 µeq/l. A limit of 10 percent change in ANC reduction was adopted for lakes with an ANC greater than 25 µeq/l.

3.2.2.2 Wildlife

Wildlife resource associated with each parcel/partial parcel available to offer for leasing are listed under the parcel headings above. Studies conducted by Matt Holloran for the Greater sage-grouse, Joel Berger for pronghorn, and Hall Sawyer for mule deer demonstrated that intense oil and gas development such as that occurring on the Pinedale Anticline can affect these species use of the habitat in close proximity to the development. Parcels 20, 21 and 23, 39, 42, 51, 53, 61, 64, 69, 70, 71, 72, 73, 74, 75, 76, 79, 80, 81, 88, 90, 96, 99, 103, 104, 105, 106, 109, 115, 117, 120 and 121 intersect big game migration corridors as delineated by the Wyoming Game and Fish Department. Parcels 069-076 fall with the nationally known pronghorn migration route, other parcels fall within the transition habitat between summer and winter (see figure 1 in the Big Game Migration Corridors in Wyoming, Feeney, et al, 2004, University of Wyoming).

3.2.2.3 Special Status Species

Section 7 of the Endangered Species Act (ESA) requires that BLM land managers 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 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 and IM WY-2010-027; (Update of the Bureau of Land Management, Wyoming, Sensitive Species List - 2010) is to conserve listed species and the ecosystems on which they depend and to ensure that actions

authorized or carried out by 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 species 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.

By BLM policy, species proposed for federal listing are to be managed with the same level of protection provided for threatened and endangered species. 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 Kemmerer, Pinedale, Rawlins, and Green River RMP management objectives, activity level plans, and other aquatic habitat and fisheries management direction, including 50 CFR 17, the Land Use Planning Handbook, Appendix C, Part E, Fish and Wildlife.

The Kemmerer, Pinedale, Rawlins, and Green River RMPs provide listings of sensitive species within the field office areas and have evaluated the need to protect habitat necessary for the success of species identified through these regulations and policies. New information regarding the status of the Greater sage-grouse has elevated its status from a BLM sensitive species to a federal candidate species. The Greater sage-grouse is a candidate species for listing under provisions of the ESA as determined by the USFWS and documented in a March 5, 2010 Federal Register notice declaring that listing of the Greater sage-grouse was warranted but precluded. Greater sage-grouse are distributed in sagebrush habitat throughout the central and western portions of the High Desert District, where habitat fragmentation and degradation has not reduced habitat to unsuitable. Greater sage-grouse leks are generally at mid elevations within sagebrush habitat. Nesting and brood-rearing habitat is sometimes associated with the lek and sometimes found at a distance from the lek in sagebrush habitat. These remaining suitable sagebrush habitat areas could be productive for Greater sage-grouse; however, fragmentation and degradation might limit the distribution and abundance of Greater sage-grouse. The Wyoming Game and Fish Department (WGFD) have delineated Greater sage-grouse core areas, which represent these relatively productive areas, and have suggested special management for those areas.

Policy was issued by the Wyoming BLM in December 2009 under IM WY-2010-012 (Greater sage-grouse Habitat Management Policy on Wyoming Bureau of Land Management (BLM) Administered Public Lands including the Federal Mineral Estate) and WY-2010-013 (Oil and Gas Lease Screen for Greater sage-grouse); additional policy was issued by the Washington Office BLM under IM WO 2010-071 (Gunnison and Greater sage-grouse Management Considerations for Energy Development (Supplement to *National Greater sage-grouse Habitat Conservation Strategy*)). The processed Oil and Gas Lease Screen for Greater sage-grouse for the parcels that would be offered for lease can be found in Appendix B.

There are many sources of habitat fragmentation, all of which may affect the Greater sage-grouse. Industrial development, livestock and wildlife grazing, mining, gravel pit operations, oil and gas activity, land exchanges and disposal, vegetation manipulation, fuel reduction projects and other activities may introduce an artificial components to the natural habitat. Structures such as powerlines and 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 become an important factor in Greater sage-grouse survival. To date, there is only one known case of West Nile in Greater sage-grouse within the HDD. However, the potential does exist for the virus to occur more frequently within the Kemmerer and Rawlins Field Offices due to water impoundments associated with produced water disposal, reservoirs, stock tanks or other features that would create an environment suitable for mosquito larva to persist.

Greater sage-grouse have been declining across the west, which has prompted several petitions to list them as threatened under the ESA, including a recent petition that led to the March 5, 2010 finding by the USFWS of warranted for listing but precluded. The areas in central and western Wyoming where sagebrush dominates landscapes and grouse populations remain relatively contiguous and intact cumulatively represent one of the species' last strongholds. The number of male Greater sage-grouse counted per lek in Wyoming decreased 17 percent between 1985 and 1995 (RRMP), and regional declines as high as 73 percent between 1988 and 1999 have been recorded. No causative factors have been identified that explain population reductions throughout Wyoming, although changes in the sagebrush-dominated areas where the birds typically reside are thought to be among the principal factors.

Parcels 001-019, 021-026, and part of parcel 020 are located in the Platte River drainage which provides habitat for the threatened and endangered pallid sturgeon fish species. Parcels 036-042, 047-055, 057-116, 118, 119, and part of parcel 117 are in the Colorado River drainage which provides habitat for the threatened and endangered Colorado pikeminnow, razorback sucker, bonytail, and humpback chub fish species. Parcel 068 in the Rock Springs Field Office contains a segment of Trout Creek and is in close proximity to a segment of Gooseberry Creek, both of which contain conservation populations of Colorado River cutthroat trout (CRCT). Trout Unlimited is working with partners in irrigation and fish passage improvements within the watersheds associated with these streams. Parcels 036-040 fall within Savery Creek drainage the is designated as a potential CRCT recovery area. Parcel 039 contains the West Fork Loco Creek tributary of Savory Creek, which is also designated for potential CRCT recovery.

Parcels 42 and 55 fall within the Muddy Creek watershed that also has certain tributaries designated for potential CRCT recovery; however neither parcel actually contains one of the designated potential recovery streams. Trout Unlimited and project partners (BLM and Wyoming Game and Fish) have just completed a $245,000 culvert removal and channel restoration project on upper Muddy Creek. The Wyoming Game and Fish, and the BLM have been working in this drainage, improving native fish populations for over a decade. TU and project partners have plans for multiple projects within this drainage over the next 2 to 3 years.

In 2006, USFWS, BLM, USFS, NPS, and fish & wildlife management agencies in Colorado, Wyoming, and Utah jointly developed a conservation agreement and strategy to "assure the long-term viability of CRCT throughout their historic range."

Parcels 120-125 and part of parcel 117 are located in the Bear River drainage. Portions of the Bear River and its tributaries contain conservation populations of Bonneville cutthroat trout (BCT) or are identified as having the potential for BCT expansion. The BCT is a designated

sensitive species. In 2008 the USFWS determined that there is a viable, self-sustaining Bonneville cutthroat trout population well distributed throughout its historic range and that the population is being restored or protected in all currently occupied watersheds; it was subsequently determined that the Bonneville cutthroat trout did not warrant listing as a threatened or endangered species under the Endangered Species Act.

Thomomys clusius (Wyoming pocket gopher), a species on the BLM Wyoming sensitive species list, was petitioned to be including on the threatened and endangered species list. US Fish and Service subsequently determined that listing was not warranted. The Wyoming pocket gopher is known to occur only in Sweetwater and Carbon Counties in Wyoming. As its range is currently defined, the Wyoming pocket gopher appears to occur primarily on multiple-use lands managed by the BLM. These lands are extensively intermixed with parcels of private land. A variety of biological factors can make animals intrinsically susceptible to disturbance, including narrow distribution, habitat specificity, restrictive territoriality and area requirements, susceptibility to disease, low dispersal capability, high site fidelity, and low reproductive capability.

3.2.2.3 Lands With Wilderness Characteristics

Wilderness characteristics are resource values that include naturalness, outstanding opportunities for solitude, or outstanding opportunities for primitive and unconfined recreation. Areas evaluated for wilderness characteristics generally occur in undeveloped locations of sufficient size (typically greater than 5,000 contiguous acres) to be practical to manage for these characteristics.

The BLM Land Use Planning Handbook (H-1601-1) states that the BLM must consider the management of lands with wilderness characteristics during the land use planning process. The criteria used to identify these lands are essentially the same criteria used for determining wilderness characteristics for wilderness study areas (WSA). However, the authority set forth in section 603(a) of FLPMA to complete the three-part wilderness review process (inventory, study, and report to Congress) expired on October 21, 1993; therefore, FLPMA does not apply to new WSA proposals and consideration of new WSA proposals on BLM-administered public lands is no longer valid. The BLM is still required under Section 201 of FLPMA to ". . .maintain on a continuing basis an inventory of all public lands and their resource and other values . . ." This includes reviewing lands, in this case lease parcels, to determine if they possess wilderness characteristics (refer to Appendix D). Accordingly, the parcels (excluding WY-1111-041, 054,and 078 that are not available for leasing) were screened to determine whether the parcels, or portions of the parcels, are located in areas that contain wilderness characteristics.

The draft EA (DOI-BLM-WY-030-2011-123-EA) released for public review and comment on April 19, 2001concluded that parcels 001-040, 042-053, 055-057, 062, 066, 067, 074-077, 079-096, and 102-125 are not located in areas containing wilderness characteristics; whereas, parcels or portions of the parcels WY-1111-058-061, 063-065, 068-073, and 097-101 were located in areas that meet size requirement for wilderness characteristics, but where BLM lacks current inventory data to ascertain whether or not they "*generally appear to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable.*" And further concluded that BLM must complete field reviews to determine if areas containing these parcels meet the this and the other evaluation requirements and proposed these parcels be deferred from the November sale pending completion of the field review.

Parcels WY-1111-058-061, 063-065 fall within the Adobe Town DRUA that was developed through the Rawlins RMP analysis of a citizen's wilderness proposal. Parcel 066 is a 640 acre section within the Kinney Rim North citizen wilderness proposal (CWP). The parcel is in the checkerboard, is bounded on all four sides by private land, and is bisected by BLM Road 4407/Sweetwater County Road 19 through the south eastern quadrant. Based on this parcel 066 does not meet the size criteria for wilderness characteristics. This is corroborated by a 2002 inventory the concluded the Kinney Rim North CWP "*does not have supplemental values. Due to the abundance of human impacts, the area was determined not to have wilderness characteristics.*"

Subsequent to the draft EA being released for public review and comment on April 19, 2011, the Rock Springs Field Office was able to complete a field review for lands with wilderness characteristics for parcel 068 on June 29, 2011, and the Rawlins Field Office located a 2002 wilderness characteristics inventory for the South Kinney Rim CWP, which includes parcels WY-1111-058, 059, 060, 061, 063, 064, and 065. The field inventory for parcel 068 determined that the area west of County Road 34 does not have wilderness characteristics due to the extent of human made intrusions. The area east of County Road 34 was determined to meet the naturalness and outstanding opportunity for solitude or a primitive and unconfined type of recreation. Approximately 590 acres of parcel 068 is located east of the County Road.

The 2002 inventory of the Kinney Rim South CWP determined that the "area does not have supplemental values. Due to the abundance of human impacts, the area was determined not to have wilderness characteristics."

There are no congressionally designated wilderness areas on BLM-administered lands within the HDD, but there are five wilderness study areas located within the RFO, one in KFO, two in PFO, and thirteen in RSFO (note Adobe Town WSA occurs within portions of the Rawlins and Rock Springs Field Offices). They are:

<u>Rawlins Field Office</u>
- Adobe Town WSA
- Ferris Mountains WSA
- Encampment River Canyon WSA
- Prospect Mountain WSA
- Bennett Mountains WSA.

<u>Kemmerer Field Office</u>
- Raymond Mountain WSA

<u>Pinedale Field Office</u>
- Scab Creek WSA
- Lake Mountain WSA

<u>Rock Springs Field Office</u>
- Adobe Town WSA
- Whitehorse Creek WSA
- Honeycomb Buttes WSA
- Oregon Buttes WSA

Alkali Draw WSA
South Pinnacles Buttes WSA
Alkali Basin/East Sand Dunes WSA
Sand Dunes WSA
Buffalo Hump WSA
Red Creek Badlands WSA
Devil's Playground WSA
Twin Buttes WSA
Red Lake WSA

WSAs are managed according to the non-impairment standard. Under this standard, these lands are managed in a manner so as not to impair the suitability of such areas for preservation as wilderness. At present, the BLM manages these lands in accordance with the Kemmerer, Pinedale, Rawlins, and Green River RMPs, and the Interim Management Policy for Lands Under Wilderness Review until Congress either designates each WSA as "wilderness" or releases it from consideration and the land reverts to multiple-use management. None of the parcels on the November 2011 list are within or adjacent to any of the WSAs; however parcels 058-061 & 063-065 are located between 1 and 9 miles west of the Adobe Town WSA.

3.2.2.4 Cultural And Paleontology Resources

All parcels addressed in this EA, have the potential to contain surface and buried archaeological materials. Once the decision is made by the lessee to develop a lease, area specific cultural records review would be done to determine if there is a need for a cultural inventory of the areas that could be affected by the subsequent surface disturbing activities. Generally, a cultural inventory will be required before new surface disturbance and all historic and archaeological sites that are eligible for listing in the National Register of Historic Places or potentially eligible to be listed would be either avoided by the undertaking or have the information in the sites extracted through archaeological data recovery before surface disturbance. Parcel 075 containing the Rocks Archaeological District in the Pinedale FO and a portion of parcel 112 containing the Bridger Antelope Trap in KFO would be deferred from offering for lease pending Native American consultation.

The parcels addressed in the EA also have a potential to contain vertebrate fossils. Post-lease development proposals would be evaluated on a case-by-case basis to determine if paleontological surveys would be required prior to surface disturbance.

3.2.2.5 Socioeconomics Resources

The proposed lease parcels are located in Albany, Carbon, Laramie, Lincoln, Sublette, Sweetwater, and Uinta Counties, Wyoming. Table 3.1.1 shows changes in population for each county between 2000 and 2010. In terms of the actual number of people, Laramie County was the fastest-growing county, increasing its population by a more than 10,000 individuals; Carbon County had the smallest population change which was closest to the national average. Sublette County had a 73.1 percent increase.

Table 3.1: Population by County, 1980-2000

Area	Population in 2000	Population in 2010	Change 1980-2000	
			Total	Percent

Albany County	32,014	36,299	4,285	13.4
Carbon County	15,639	15,885	246	1.6
Laramie County	81,607	91,738	10,131	12.4
Lincoln County	14,573	18,106	3,533	24.2
Sublette County	5,920	10,247	4,327	73.1
Sweetwater County	37,613	43,806	6,193	16.5
Uinta County	19,742	21,118	1,376	7.0
Wyoming	206,608	237,199	30,591	14.8

Sources: U.S. Census Bureau

Social conditions in the Kemmerer, Pinedale, Rawlins, and Rock Springs Field Office areas that concern human communities include towns, cities, rural areas, and the custom, culture, and history of the area as it relates to human settlement, as well as current social values. BLM management actions can impact social conditions in the area and in nearby communities. The area considered for this analysis is comprised of the counties of Albany, Carbon, Laramie, Lincoln, Sublette, Sweetwater, and Uinta.

The economy of the study area is based primarily on resource development (e.g., mining, agriculture) and services. Mining, including oil and gas, provides a large part of the employment and income of the communities in the area. Mining has been the key economic driver for development of the communities in southwestern Wyoming and continues to provide much of the economic base in terms of jobs, household incomes, and tax revenues that allow governments at the local, state, and national level to attempt to meet the demand for essential services that is being driven by the growth in the oil and gas sector.

Although the U.S. Census Bureau (2006) does not make available all data on employee counts and payrolls due to confidentiality requirements, the data that are provided help to show the economic importance of mineral commodities. The mining demographic statistics, which include oil and gas exploration, extraction, and associated operations, for 2006 show that mining and oil and gas development are a lesser component of the economic status in southeastern Wyoming (Albany and Laramie Counties); whereas as it is a more important component of the economic employment base in south central and southwestern Wyoming. Mining or oil and gas related jobs in Albany County comprise 0.2 percent of the employment base; in Laramie County 0.4 percent; in Carbon County 3 percent; in Sweetwater County 20 percent; in Uinta County 8 percent; in Lincoln County 7 percent; and in Sublette County it comprises 25 percent.

In general, resource development and protection are both important to sustaining the values within the area. However, the challenge is seeking an appropriate balance between resource development and protection, which is central to the BLM's mission and the RMP process. Therefore, even though some individuals and groups give a high priority to resource protection, others give a high priority to resource development; it is incumbent on the BLM to find an appropriate balance between these two competing philosophies.

3.2.2.6 Environmental Justice

Executive Order 12898 requires Federal agencies to assess projects to ensure there is no disproportionately high or adverse environmental, health, or safety impacts on minority and low income populations. A review of the parcels offered for lease indicates there are no disproportionately high or adverse impacts on minority and low-income populations.

3.2.2.7 Invasive, Non-Native Species

While there are no known populations of invasive or non-native species on the proposed parcels, infestations of noxious weeds can have a negative impact on biodiversity and natural ecosystems. Noxious weeds affect native plant species by out-competing native vegetation for light, water and soil nutrients. Locally, regionally, and nationally noxious weeds infestations result in cause decreased quality of agricultural products due to high levels of competition from noxious weeds; decreased quantity of agricultural products due to noxious weed infestations; and increased costs to control and/or prevent the noxious weeds.

Furthermore, noxious weeds can negatively affect livestock and dairy producers by displacing forage and/or making forage either unpalatable or toxic to livestock, thus decreasing livestock productivity and potentially increasing producers' feed and animal health care costs. Increased costs to livestock and dairy producers are eventually borne by consumers.

Recent federal legislation has been enacted requiring state and county agencies to implement noxious weed control programs. Monies would be made available for these activities from the federal government, generated from the federal tax base. Therefore, all citizens and taxpayers of the United States are directly affected when noxious weed control/prevention is not exercised. The field offices work cooperatively with county and local weed control agencies to identify and manage noxious weeds.

3.2.2.8 Wastes (Hazardous and/or Solid)

There are no identified hazardous or solid waste sites on the parcels addressed in this EA. Should a parcel be leased and developed, generation and temporary storage of waste materials (solid and liquid) would likely occur. They would be managed in accordance with Onshore Orders 1 & 7, Resource Conservation and Recovery Act (RCRA), applicable Wyoming Department of Environmental Quality (WDEQ) regulations, and Wyoming Oil and Gas Conservation Commission (WOGCC) rules. Fluid handling would be evaluated at the development stage and fluids associated with any subsequent drilling and/or production would either be treated, evaporated, or transferred to an approved WDEQ treatment facility; solids would be treated on site or transferred to a WDEQ approved facility.

3.2.2.9 Water Quality (Surface and Ground)

Surface water hydrology within the area is typically determined by geology, precipitation, and water erosion. Factors that currently affect surface water resources include livestock grazing management, private, commercial and industrial development, recreational use, drought, and vegetation control treatments. The referenced RMPs/FEISs provide additional information on water quality, which is hereby incorporated by reference. Ephemeral drainages that discharge into perennial waters are located within the various parcels/partial parcels available for offer. Spring fed perennial surface waters do exist within a number of the proposed parcels: parcel 1111-003 contains a short segment of Halleck Creek; parcel 009 has a segment of a branch of Austin Creek; parcel 013 contains a segment of Seminoe Reservoir; parcel 014 contains a segment of Saint Mary's Creek, parcel 18 has a segment of Devesse Creek, parcels 020, 022,

023 and 024 have short segments of Rankin Creek; parcel 026 has a segment of School Creek, parcel 39 has a segment of West Loco Creek with three reservoirs; parcel 040 has a segment of Coal Gulch; parcel 051 has a segment of Cottonwood Creek; parcel 053 has a segment of Deep Creek; parcel 057 has a segment of Wild Cow Creek; parcel 068 has a segment of Trout Creek and Gooseberry Creek; parcel 079 contains Shelton Lake and a segment of Lane Meadow Creek; parcels 080, 081, 084, and 087 contain segments of West, Middle, and East Canyon Creeks; parcels 089 and 090 have a segment of Sage Creek; parcel 091 has a segment of Honey Creek; parcels 096, 103, 105, and 107 have segments of Willow Creek; parcels 097 and 101 have segments of North Willow Creek; parcel 098 has a segment of Fontenelle and Raney Creeks; parcels 099 and 100 have segments of Raney Creek; parcel 106 has a segment of Coal Branch Creek; parcels 109 and 111 have a segment of Clear Creek; parcel 113 has a very short segment of the North Fork of Little Muddy Creek; parcel 119 has a segment of Sheep Creek; and parcel 120 has a segment of the Bear River. Portions of parcels 010, 011, 014, and 015 fall within a mile of Seminoe Reservoir.

Groundwater hydrology within the area is primarily a product of geology and recharge rates. Groundwater quality and quantity can be influenced by precipitation, and water supply wells and various disposal activities. Groundwater quality across the Kemmerer, Pinedale, Rawlins, and Rock Springs Field Offices varies with depth from potable waters with low total dissolved solids (TDS) to highly saline, non-potable sources; additionally known areas of fluoride levels in exceedances of state water quality standards exist within all four field offices. Most of the groundwater in KFO, PFO, RFO, and RSFO area is used for industrial, domestic and livestock purposes. Parcels 095, 103, 106, and 107contain rural residential subdivisions that have residential water supply wells. Parcel 124 is adjacent to a rural residence that likely has a domestic water supply well. Otherwise, there are no known domestic water supply sources on or in the general vicinity of the available parcels/partial parcels.

3.2.2.10 Recreation

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).

3.2.2.11 Public Health And Safety

Oil and gas development, as well as other industrial use such as coal and trona mining has been occurring in the Kemmerer, Pinedale, Rawlins, and Rock Springs Field Offices for many decades. Due to the scattered nature and the small area encompassed by the respective parcels coupled with the industrial safety programs, standards, and state and federal regulations, offering these parcels is not expected to materially increase health or safety risks to humans, wildlife, or livestock. The areas containing the lease parcels have been under oil and gas development for

many years. Leasing of the parcels analyzed in this EA would present no new or unusual health or safety issues not covered by existing state and federal laws and regulation. In accordance with Federal Aviation Administration regulation surface use restrictions would be applied to parcels located within 10,000 feet of the runways of public airports.

ENVIRONMENTAL IMPACTS

4.0 Description of Impacts

4.0.1 General Discussion

As previously stated, the sale and issuance of oil and gas leases is strictly an administrative action. Nominated leases are reviewed against the appropriate land use plan, and stipulations are attached to mitigate any known environmental or resource conflicts that may occur on a given lease parcel. On-the-ground impacts would not occur until a lessee applies for and receives approval to drill on the lease. The BLM cannot determine at the leasing stage whether or not a proposed parcel will actually be sold, or if it is sold and issued, whether or not the lease would be explored or developed. Consequently, the BLM cannot determine exactly where a well or wells may be drilled or what technology that may be used to drill and produce wells, so the impacts listed below are more generic, rather than site-specific. Additional NEPA analysis would be conducted prior to approval of an APD. This additional environmental documentation would provide site-specific analysis for that well location. Additional mitigation and BMPs (conditions of approval) may be applied at that time to mitigate identified impacts.

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 of an APD to drill may be the first useful 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). In addition, the IBLA has decided that, "BLM is not required to undertake a site-specific environmental review before 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). BLM has not received any development proposals concerning the proposed lease parcels addressed in this EA.

4.1 Impacts of Alternative A (No Action)

Under this alternative none of the parcels designated as available (80 entire parcels and 10 partial parcels in Alternative B and 122 in Alternative C) would be offered for lease and there would be no subsequent physical impact to the existing environment caused by post-lease well development. The only impact resulting from the No Action Alternative would be to socioeconomics.

4.1.1 Socioeconomic Resource:

Based on the assumption that all of parcels and partial parcels that are designated as available for sale and would be sold and based on the minimum acceptable bid of $2.00 per acre, the

government would lose the opportunity to collect a minimum of $211,508.92 under Alternative B and $345,450.30 under Alternative C in lease fees, as well as any royalties that would be collected from any subsequent hydrocarbon production. Typically, lease bids are substantially higher than the $2.00 per acre minimum; consequently the economic loss would likely be much higher than that projected. The State of Wyoming, as well as many counties and communities there, rely on oil and gas development for part of their economic base. The employment and purchasing opportunities associated with developing and producing wells on the leases is also foregone, as would the opportunity to provide oil and gas resources from these lease parcels to help meet the nation's energy needs. Refer to the Kemmerer, Pinedale, Rawlins, and Green River RMPs and FEISs for additional socioeconomic analysis.

4.2 Impacts of Alternative B (Proposed Action)

Alternative B would result in 80 entire parcels and 10 partial parcels being offered at the November 2011 BLM Wyoming oil and gas lease sale. Again the reader is reminded that at the leasing stage BLM cannot predict whether or not any of the parcels will actually be sold, if they are sold and a lease is issued whether or not they will actually be developed, and if development does occur what the development level would be. Table 4.1a displays the stipulations that would be applied to each parcel to mitigate impacts. Parcels that would be offered in whole under Alternative B are WY-1111-001-015, 017, 018, 032, 034-040, 043-053, 055-061, 062, 063-066, 066, 067, 068, 074, 076, 077, 079, 082, 088-092, 096, 102, 104, 108-111, and 113-125. Parcels that would be offered in part are WY-1111-020, 026, 029, 033, 080, 081, 083, 087, 105, and 112. The part of parcel 042 that falls outside the Upper Muddy Creek/Grizzly WHMA would be offered under Alternative B.

Table 4.1a Lease Notices, Timing Limitation Stipulations (TLS) and No Surface Occupancy (NSO) Stipulations Applied to the Lease Parcels Based on Affected Resources Elements Identified In the Affect Environment Section (Part 1)

Parcel # WY-1111-	Lease Notice #1[1]	Lease Notice #2[2]	Lease Notice #3[3]	Big Game Winter TLS	Greater sage-grouse Nesting TLS	B. Owl/ Raptor Nesting TLS	Mountain Plover TLS	Bald Eagle Roost/Nest TLS or NSO	Greater sage-grouse winter TLS	Airport NSO or CSU	Big Game Birthing CSU
001	*applied*	*applied*	*applied*				*applied*				
002	*applied*	*applied*	*applied*				*applied*				
003	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*		*applied*	*applied*		
004	*applied*	*applied*	*applied*		*applied*	*applied*			*applied*		
005	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*		*applied*	*applied*		
006	*applied*	*applied*	*applied*		*applied*	*applied*			*applied*		
007	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*		*applied*	*applied*		
008	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*				
009	*applied*	*applied*	*applied*		*applied*	*applied*					
010	*applied*	*applied*	*applied*		*applied*	*applied*	*applied*		*applied*		
011	*applied*	*applied*	*applied*	*applied*			*applied*		*applied*		
012	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
013	*applied*	*applied*	*applied*		*applied*	*applied*					
014	*applied*	*applied*	*applied*		*applied*	*applied*	*applied*				
015	*applied*	*applied*	*applied*		*applied*	*applied*	*applied*				
016	*applied*	*applied*	*applied*		*applied*		*applied*	*applied*			
017	*applied*	*applied*	*applied*		*applied*						
018	*applied*	*applied*	*applied*	*applied*	*applied*						
019	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*				

Parcel # WY-1111-	Lease Notice #1[1]	Lease Notice #2[2]	Lease Notice #3[3]	Big Game Winter TLS	Greater sage-grouse Nesting TLS	B. Owl/ Raptor Nesting TLS	Mountain Plover TLS	Bald Eagle Roost/Nest TLS or NSO	Greater sage-grouse winter TLS	Airport NSO or CSU	Big Game Birthing CSU
020	*applied*	*applied*	*applied*		*applied*						
021	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
022	*applied*	*applied*	*applied*	*applied*	*applied*						
023	*applied*	*applied*	*applied*		*applied*	*applied*					
024	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
025	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
026	*applied*	*applied*	*applied*		*applied*						
027	*applied*	*applied*	*applied*		*applied*						
028	*applied*	*applied*	*applied*		*applied*						
029	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
030	*applied*	*applied*	*applied*		*applied*						
031	*applied*	*applied*	*applied*	*applied*	*applied*		*applied*				
032	*applied*	*applied*	*applied*	*applied*	*applied*						
033	*applied*	*applied*	*applied*	*applied*	*applied*		*applied*				
034	*applied*	*applied*	*applied*	*applied*	*applied*		*applied*				
035	*applied*	*applied*	*applied*	*applied*	*applied*		*applied*				
036	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
037	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
038	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
039	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
040	*applied*	*applied*	*applied*		*applied*	*applied*					
041	Parcel is in an area designated as unavailable for leasing under the Rawlins RMP										
042	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					

Parcel # WY-1111-	Lease Notice #1[1]	Lease Notice #2[2]	Lease Notice #3[3]	Big Game Winter TLS	Greater sage-grouse Nesting TLS	B. Owl/ Raptor Nesting TLS	Mountain Plover TLS	Bald Eagle Roost/Nest TLS or NSO	Greater sage-grouse winter TLS	Airport NSO or CSU	Big Game Birthing CSU
043	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*				
044	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*				
045	*applied*	*applied*	*applied*	*applied*	*applied*		*applied*				
046	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*				
047	*applied*	*applied*	*applied*	*applied*	*applied*						
048	*applied*	*applied*	*applied*		*applied*	*applied*					
049	*applied*	*applied*	*applied*		*applied*	*applied*					
050	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
051	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
052	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
053	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
054	Parcel is in an area designated as unavailable for leasing under the Rawlins RMP										
055	*applied*	*applied*	*applied*	*applied*	*applied*						
056	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
057	*applied*	*applied*	*applied*		*applied*	*applied*	*applied*				
058	*applied*	*applied*	*applied*		*applied*	*applied*	*applied*				
059	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
060	*applied*	*applied*	*applied*		*applied*	*applied*	*applied*				
061	*applied*	*applied*	*applied*		*applied*	*applied*	*applied*				
062	*applied*	*applied*	*applied*								
063	*applied*	*applied*	*applied*		*applied*	*applied*					
064	*applied*	*applied*	*applied*		*applied*						
065	*applied*	*applied*	*applied*		*applied*						

Parcel # WY-1111-	Lease Notice #1[1]	Lease Notice #2[2]	Lease Notice #3[3]	Big Game Winter TLS	Greater sage-grouse Nesting TLS	B. Owl/ Raptor Nesting TLS	Mountain Plover TLS	Bald Eagle Roost/Nest TLS or NSO	Greater sage-grouse winter TLS	Airport NSO or CSU	Big Game Birthing CSU
066	*applied*	*applied*	*applied*								
067	*applied*	*applied*	*applied*	*applied*	*applied*						
068	*applied*	*applied*	*applied*			*applied*					
069	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
070	*applied*	*applied*	*applied*	*applied*	*applied*						
071	*applied*	*applied*	*applied*	*applied*	*applied*						
072	*applied*	*applied*	*applied*	*applied*	*applied*						
073	*applied*	*applied*	*applied*	*applied*	*applied*						
074	*applied*	*applied*	*applied*		*applied*	*applied*	*applied*				
075	*applied*	*applied*	*applied*		*applied*	*applied*	*applied*				
076	*applied*	*applied*	*applied*		*applied*	*applied*	*applied*				
077	*applied*	*applied*	*applied*	*applied*							
078	Parcel is in an area designated as unavailable for leasing under the Pinedale RMP										
079	*applied*	*applied*	*applied*	*applied*							
080	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
081	*applied*	*applied*	*applied*		*applied*						
082	*applied*	*applied*	*applied*	*applied*		*applied*					
083	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
084	*applied*	*applied*	*applied*		*applied*						
085	*applied*	*applied*	*applied*		*applied*						
086	*applied*	*applied*	*applied*		*applied*						
087	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
088	*applied*	*applied*	*applied*	*applied*							

Parcel # WY-1111-	Lease Notice #1[1]	Lease Notice #2[2]	Lease Notice #3[3]	Big Game Winter TLS	Greater sage-grouse Nesting TLS	B. Owl/ Raptor Nesting TLS	Mountain Plover TLS	Bald Eagle Roost/Nest TLS or NSO	Greater sage-grouse winter TLS	Airport NSO or CSU	Big Game Birthing CSU
089	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
090	*applied*	*applied*	*applied*	*applied*	*applied*						*applied*
091	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
092	*applied*	*applied*	*applied*		*applied*	*applied*					
093	*applied*	*applied*	*applied*							*applied*	
094	*applied*	*applied*	*applied*								
095	*applied*	*applied*	*applied*		*applied*	*applied*					
096	*applied*	*applied*	*applied*			*applied*					
097	*applied*	*applied*	*applied*	*applied*		*applied*					
098	*applied*	*applied*	*applied*	*applied*	*applied*						
099	*applied*	*applied*	*applied*		*applied*						
100	*applied*	*applied*	*applied*		*applied*						
101	*applied*	*applied*	*applied*	*applied*	*applied*						
102	*applied*	*applied*	*applied*	*applied*		*applied*					
103	*applied*	*applied*	*applied*		*applied*	*applied*					
104	*applied*	*applied*	*applied*	*applied*						*applied*	
105	*applied*	*applied*	*applied*	*applied*		*applied*					
106	*applied*	*applied*	*applied*		*applied*						
107	*applied*	*applied*	*applied*		*applied*						
108	*applied*	*applied*	*applied*	*applied*		*applied*					
109	*applied*	*applied*	*applied*	*applied*		*applied*					
110	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*				
111	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*				

Parcel # WY-1111-	Lease Notice #1[1]	Lease Notice #2[2]	Lease Notice #3[3]	Big Game Winter TLS	Greater sage-grouse Nesting TLS	B. Owl/ Raptor Nesting TLS	Mountain Plover TLS	Bald Eagle Roost/Nest TLS or NSO	Greater sage-grouse winter TLS	Airport NSO or CSU	Big Game Birthing CSU
112	*applied*	*applied*	*applied*	*applied*		*applied*					
113	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
114	*applied*	*applied*	*applied*	*applied*							
115	*applied*	*applied*	*applied*	*applied*		*applied*					
116	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*					
117	*applied*	*applied*	*applied*								
118	*applied*	*applied*	*applied*			*applied*					
119	*applied*	*applied*	*applied*								
120	*applied*	*applied*	*applied*	*applied*	*applied*	*applied*		*applied*			
121	*applied*	*applied*	*applied*	*applied*		*applied*					
122	*applied*	*applied*	*applied*		*applied*		*applied*	*applied*		*applied*	
123	*applied*	*applied*	*applied*		*applied*		*applied*	*applied*		*applied*	
124	*applied*	*applied*	*applied*		*applied*						
125	*applied*	*applied*	*applied*				*applied*				

1 Lease Notice 1 is applied to all parcels and prohibits or restricts surface disturbing activities on slopes over 25%, within 500’ of surface water and riparian/wetland areas, with specified distances of highways, within ¼ mile of occupied dwellings, and construction with frozen ground .
2 Lease Notice 2 is applied to all parcels and alerts lessees that that the lease may contain National Historic Trails that may affect development operations.
3 Lease Notice 3 is applied to all parcels and alerts the lessee that they may be required to implement s measures to reduce impacts to Greater sage-grouse.

Table 4.1a Lease Notices, Timing Limitation Stipulations (TLS) and No Surface Occupancy (NSO) Stipulations Applied to the Lease Parcels Based on Affected Resources Elements Identified In the Affect Environment Section (Part 2)												
Parcel # WY-1111-	SG/ Sharp-Tailed Lek CSU	Raptor CSU	Amphib. Species CSU	Cult. Res. CSU or NSO	Historic Trails/ CSU	Sensitive Species CSU	DRUA CSU	VRM II CSU	Coal CSU	SRMA/ SMA/ WHMA CSU	Flora/ Fauna NSO	Big Game Migrate CSU
001			*applied*			*applied*						
002			*applied*			*applied*						
003			*applied*		*applied*	*applied*		*applied*				
004	*applied*	*applied*	*applied*	*applied*		*applied*						
005	*applied*		*applied*	*applied*		*applied*						
006	*applied*	*applied*	*applied*	*applied*		*applied*						
007	*applied*		*applied*	*applied*		*applied*						
008	*applied*		*applied*			*applied*						
009			*applied*			*applied*						
010	*applied*		*applied*			*applied*		*applied*	*applied*			
011						*applied*		*applied*	*applied*			
012		*applied*	*applied*	*applied*		*applied*						
013			*applied*			*applied*		*applied*				
014			*applied*			*applied*		*applied*	*applied*			
015			*applied*			*applied*		*applied*				
016				*applied*		*applied*				*applied*		
017			*applied*			*applied*		*applied*				

Parcel # WY-1111-	SG/ Sharp-Tailed Lek CSU	Raptor CSU	Amphib. Species CSU	Cult. Res. CSU or NSO	Historic Trails/ CSU	Sensitive Species CSU	DRUA CSU	VRM II CSU	Coal CSU	SRMA/ SMA/ WHMA CSU	Flora/ Fauna NSO	Big Game Migrate CSU
018						*applied*		*applied*		*applied*		
019				*applied*		*applied*						
020			*applied*			*applied*		*applied*		*applied*	*applied*	
021	*applied*		*applied*			*applied*				*applied*		
022			*applied*			*applied*		*applied*				
023	*applied*		*applied*			*applied*		*applied*				
024	*applied*	*applied*	*applied*			*applied*		*applied*				
025		*applied*				*applied*		*applied*				
026			*applied*			*applied*		*applied*		*applied*	*applied*	
027	*applied*		*applied*			*applied*						
028	*applied*		*applied*			*applied*						
029		*applied*	*applied*			*applied*						
030						*applied*						
031	*applied*		*applied*			*applied*						
032	*applied*					*applied*						
033			*applied*			*applied*						
034	*applied*		*applied*			*applied*						
035	*applied*		*applied*			*applied*						

Parcel # WY-1111-	SG/ Sharp-Tailed Lek CSU	Raptor CSU	Amphib. Species CSU	Cult. Res. CSU or NSO	Historic Trails/ CSU	Sensitive Species CSU	DRUA CSU	VRM II CSU	Coal CSU	SRMA/ SMA/ WHMA CSU	Flora/ Fauna NSO	Big Game Migrate CSU
036	*applied*		*applied*			*applied*		*applied*				
037	*applied*					*applied*		*applied*				
038		*applied*	*applied*			*applied*						
039		*applied*	*applied*			*applied*						
040		*applied*	*applied*			*applied*		*applied*				
041	Parcel is in an area designated as unavailable for leasing under the Rawlins RMP											
042		*applied*	*applied*	*applied*		*applied*				*applied*		*applied*
043		*applied*	*applied*	*applied*		*applied*				*applied*		
044		*applied*	*applied*	*applied*		*applied*				*applied*		
045			*applied*	*applied*		*applied*						
046			*applied*	*applied*		*applied*						
047						*applied*						
048	*applied*		*applied*			*applied*						
049	*applied*		*applied*			*applied*						
050		*applied*				*applied*						
051		*applied*	*applied*			*applied*						
052	*applied*	*applied*	*applied*			*applied*						

Parcel # WY-1111-	SG/ Sharp-Tailed Lek CSU	Raptor CSU	Amphib. Species CSU	Cult. Res. CSU or NSO	Historic Trails/ CSU	Sensitive Species CSU	DRUA CSU	VRM II CSU	Coal CSU	SRMA/ SMA/ WHMA CSU	Flora/ Fauna NSO	Big Game Migrate CSU
053			*applied*			*applied*						
054	Parcel is in an area designated as unavailable for leasing under the Rawlins RMP											
055				*applied*		*applied*				*applied*		
056			*applied*	*applied*		*applied*						
057		*applied*	*applied*			*applied*						
058						*applied*	*applied*					
059					*applied*	*applied*	*applied*					
060		*applied*	*applied*			*applied*	*applied*					
061		*applied*	*applied*			*applied*	*applied*					
062						*applied*						
063			*applied*			*applied*	*applied*					
064			*applied*			*applied*	*applied*					
065			*applied*			*applied*	*applied*					
066						*applied*						
067						*applied*				*applied*		
068					*applied*	*applied*				*applied*		
069						*applied*						
070					*applied*	*applied*						

Parcel # WY-1111-	SG/ Sharp-Tailed Lek CSU	Raptor CSU	Amphib. Species CSU	Cult. Res. CSU or NSO	Historic Trails/ CSU	Sensitive Species CSU	DRUA CSU	VRM II CSU	Coal CSU	SRMA/ SMA/ WHMA CSU	Flora/ Fauna NSO	Big Game Migrate CSU
071					*applied*	*applied*						
072						*applied*						
073						*applied*						
074	*applied*					*applied*						
075				*applied*		*applied*						
076	*applied*					*applied*						
077					*applied*	*applied*						
078	Parcel is in an area designated as unavailable for leasing under the Pinedale RMP											
079						*applied*				*applied*	*applied*	
080						*applied*				*applied*	*applied*	
081						*applied*				*applied*	*applied*	
082						*applied*				*applied*	*applied*	
083						*applied*				*applied*	*applied*	
084						*applied*				*applied*	*applied*	
085						*applied*				*applied*	*applied*	
086						*applied*				*applied*	*applied*	
087						*applied*				*applied*	*applied*	
088						*applied*						

Parcel # WY-1111-	SG/ Sharp-Tailed Lek CSU	Raptor CSU	Amphib. Species CSU	Cult. Res. CSU or NSO	Historic Trails/ CSU	Sensitive Species CSU	DRUA CSU	VRM II CSU	Coal CSU	SRMA/ SMA/ WHMA CSU	Flora/ Fauna NSO	Big Game Migrate CSU
089						*applied*		*applied*		*applied*		
090						*applied*		*applied*				
091						*applied*		*applied*				
092						*applied*						
093						*applied*						
094						*applied*						
095						*applied*						
096						*applied*						
097				*applied*	*applied*	*applied*		*applied*				
098						*applied*		*applied*				
099						*applied*		*applied*				
100					*applied*	*applied*		*applied*				
101				*applied*	*applied*	*applied*		*applied*				
102						*applied*						
103						*applied*			*applied*			
104						*applied*						
105				*applied*	*applied*	*applied*		*applied*				
106				*applied*		*applied*		*applied*				

Parcel # WY-1111-	SG/ Sharp-Tailed Lek CSU	Raptor CSU	Amphib. Species CSU	Cult. Res. CSU or NSO	Historic Trails/ CSU	Sensitive Species CSU	DRUA CSU	VRM II CSU	Coal CSU	SRMA/ SMA/ WHMA CSU	Flora/ Fauna NSO	Big Game Migrate CSU
107				*applied*	*applied*	*applied*		*applied*				
108						*applied*		*applied*				
109						*applied*						
110						*applied*						
111						*applied*						
112				*applied*		*applied*						
113					*applied*	*applied*		*applied*				
114						*applied*						
115						*applied*						
116	*applied*					*applied*						
117						*applied*						
118						*applied*						
119						*applied*						
120		*applied*				*applied*						
121						*applied*						
122	*applied*					*applied*						
123	*applied*					*applied*						
124						*applied*						
125						*applied*						

4.2.1 Air Resources

4.2.1.1 Air Quality

The administrative act of offering any of these parcels and the subsequent issuing of leases would have no direct impacts to air quality. Any potential effects to air quality would occur if and when the leases were developed. Any proposed development project would be subject to additional analysis of possible air effects before approval. The analysis may include air quality modeling for the activity. Over the last 10 years, the development on federal oil and gas mineral estate in the Kemmerer, Pinedale, Rawlins, and Rock Springs Field Offices has resulted in an average of 690 wells being spudded annually (61 in KFO, 375 in PFO, 188 in RFO, and 66 in RSFO). These wells would incrementally contribute a small percentage of the total emissions (including GHG's) from oil and gas activities in Wyoming.

Potential impacts of development could include increased airborne soil particles associated with the construction of new well pads, pipelines, or roads, exhaust emissions from drilling equipment, compressors, vehicles, and dehydration and separation facilities, as well as potential releases of GHG and volatile organic compounds during drilling or production activities. The amount of increased emissions cannot be quantified at this time since it is unknown how many wells might be drilled, the types of equipment needed 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 will also vary according to the characteristics of the geologic formations from which production occurs.

The Reasonably Foreseeable Development (RFD) in the Rawlins RMP assumes that 3711 federal wells would be drilled over a 20 life of project assumption (LOP), which equates to approximately 186 wells drilled per year. The RFD was derived for analysis purposes on a field office-wide basis and is not intended to be a development cap. The Reasonably Foreseeable Development Scenario (RFD) document for the Kemmerer RMP estimated that approximately 120 wells would be drilled annually for Federal minerals. The RFD for Pinedale FO is 9150 wells (457/year) and for Rock Sprigs FO is 2400 (120/year). Drilling density (i.e., wells per square mile) and number of wells drilled annually depend on a number of variables including market trends, technology available (vertical, directional, or horizontal), and the geology of the hydrocarbon-bearing zone. As a result, the number of wells that could potentially be drilled under a full field development scenario as a result of offering the leases is unknown. Current APD permitting trends within the field offices confirm that these assumptions are still accurate. From fiscal years 2000 to 2009 (October 1999 through September 30, 2009), the RFO approved 2036 APDs, or an average of 204 APDs per year; the KFO approved 431 APDs, or an average of 43 APDs per year; PFO has approved 4117 APDs, or an average of 412 APDs per year; the RSFO has approved 754 APDs, or an average of 75 APDs per year.

Subsequent development of any leases issued, would contribute a small incremental increase in overall emissions, including GHGs. When compared to total national or global emissions, the amount released as a result of potential production from the proposed lease tracts would not have a measurable effect.

Coal-bed natural gas (CBNG) development currently exists within the RFO. Approximately 8.5 percent of the active wells in the RFO are CBNG wells. The RFD grouped CBNG wells and conventional wells together in the scenario. RSFO also has existing CBNG development and has

a coal-bed natural gas RFD of approximately 15 wells per year. Based on the existing development and the RFD for the Rawlins and Rock Springs Field Offices, CBNG-related emissions can be expected. Although the RFD for the Kemmerer RMP assumes a CBNG development rate of up to 15 wells per year, there currently is no active or proposed CBNG development in the Field Office; therefore, there are no expected emissions. Coalbed natural gas development does not currently exist within PFO. Several CBNG wells exist in the field office, but have proven unproductive; therefore there are no expected emissions from this source.

4.2.1.2 Greenhouse Gas Emissions

The administrative act of leasing 80 entire parcels and portions of 10 additional parcels covering 105,231.28 acres would not result in any direct GHG emissions. However, 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 however can be made: offering the proposed tracts may contribute to drilling new wells.

Wyoming's gross GHG emissions are expected to continue to grow to 69 MMtCO2e by 2020, 56% above 1990 levels. As shown in Figure ES-3 of the inventory report, 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 in the period 1990 to 2005, the growth from this sector is projected to decline due to the assumption of decreased carbon dioxide emissions from venting at processing plants.

As of 2008, the Inventory indicates that there over 33,000 active gas and oil wells in the state, 45 operational gas processing plants, 5 oil refineries, and over 9,000 miles of gas pipelines. There are significant uncertainties associated with estimates of Wyoming's GHG emissions from this sector. This is compounded by the fact that there are no regulatory requirements to track CO2 or CH4 emissions. Therefore, estimates based on GHG emissions measurements in Wyoming are not possible at this time. (Wyoming GHG Inventory and Reference Case Projection CCS, Spring 2007)

However, as reported by the same CCS inventory report, emissions from this (fossil fuel production) sector grew by101% from 1990 to 2005 and are projected to increase by a further 10% between 2005 and 2020. The natural gas industry is the major contributor to both GHG emissions and emissions growth, with CH4 emissions from coal mining second. That said, it is worth noting that a significant portion of the emissions attributed to the natural gas industry are due to vented gas from a processing plants, many of which are used for injection in enhanced oil recovery operations. Additionally, many technological advances in emission control technology have been implemented by the oil and gas industry to reduce emission levels.

Some information and projections of impacts beyond the project scale are becoming increasingly available. Chapter 3 of the Climate Change Supplementary Information Report for Montana, North Dakota, and South Dakota (Climate Change SIR, 2010) describes impacts of climate change in detail at various scales, including the state scale when appropriate. The following bullet points summarize potential changes identified by the EPA (EPA, 2008) that are expected

to occur at the regional scale, where the proposed action and its alternatives are to take place. The EPA identifies this area as part of the Mountain West and Great Plains region (http://www.epa.gov/Region8/climatechange/pdf/ClimateChange101FINAL.pdf):

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

Other impacts could include:

- Increased particulate matter in the air as drier, less vegetated soils experience wind erosion.
- Shifts in vegetative communities which could threaten plant and wildlife species.
- Changes in the timing and quantity of snowmelt which could affect both aquatic species and agricultural needs. Projected and documented broad-scale changes within ecosystems of the U.S. are summarized in the Climate Change SIR (2010). Some key aspects include:
- Large-scale shifts have already occurred in the ranges of species and the timing of the seasons and animal migrations. These shifts are likely to continue (USGCRP 2009, as cited in the Climate Change SIR, 2010). Climate changes include warming temperatures throughout the year and the arrival of spring an average of 10 days to 2 weeks earlier through much of the U.S. compared to 20 years ago. Multiple bird species now migrate north earlier in the year.
- Fires, insect epidemics, disease pathogens, and invasive weed species have increased and these trends are likely to continue. Changes in timing of precipitation and earlier runoff increase fire risks.
- Insect epidemics and the amount of damage that they may inflict have also been on the rise. The combination of higher temperatures and dry conditions have increases insect populations such as pine beetles, which have killed trees on millions of acres in western U.S. and Canada. Warmer winters allow beetles to survive the cold season, which would normally limit populations; while concurrently, drought weakens trees, making them more susceptible to mortality due to insect attack.

While long-range regional changes might occur within this project area, it is impossible to predict precisely when they could occur. The following example summarizing climate data for the West North Central Region (MT, ND, SD, and WY) illustrates this point at the regional scale.

A potential regional effect of climate change is earlier snowmelt and associated runoff. This is directly related to spring-time temperatures. Over a 112 year record, overall warming is clearly

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

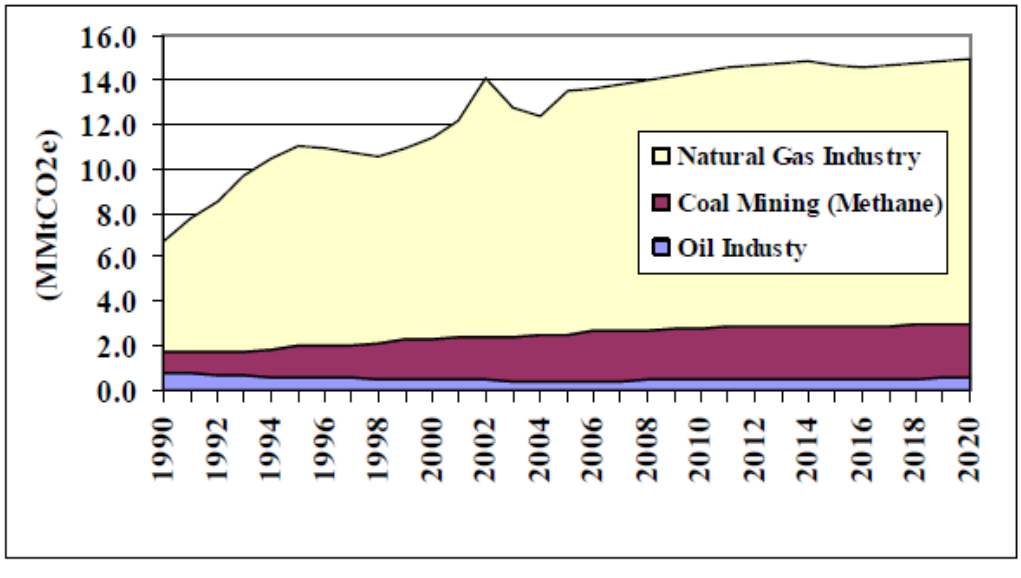
Table E2. Methane Emissions and Projections from the Fossil Fuel Industry

(Million Metric Tons CO2e)	1990	1995	2000	2005	2010	2015	2020
Fossil Fuel Industry	**6.7**	**11.0**	**11.4**	**13.5**	**14.4**	**14.7**	**14.9**
Natural Gas Industry	5.0	9.0	9.2	11.0	11.6	11.8	12.0
Production (CH_4)	0.2	0.3	0.8	1.6	2.3	2.5	2.6
Processing (CO_2 & CH_4)	4.1	7.9	7.7	8.2	7.6	7.6	7.5
Methane Emissions (CH_4)	*1.4*	*1.4*	*1.3*	*1.2*	*1.6*	*1.7*	*1.8*
Vented Gas (CO_2 & CH_4)	*2.6*	*6.5*	*6.4*	*6.9*	*6.0*	*5.9*	*5.7*
Transmission (CH_4)	0.6	0.7	0.6	1.1	1.6	1.6	1.7
Distribution (CH_4)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Oil Industry	0.8	0.6	0.5	0.4	0.5	0.5	0.5
Production (CH_4)	0.7	0.6	0.5	0.4	0.5	0.5	0.5
Refineries (CH_4)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal Mining (CH_4)	1.0	1.4	1.8	2.1	2.3	2.4	2.4

The value 0.00 in the above table indicates emissions less than 0.005 MMtCO2e.

Figure E1 displays the CH_4 emissions from coal mining and natural gas and oil systems, on an $MMtCO_2e$ basis.

Figure E1. Fossil Fuel Industry Emission Trends ($MMtCO_2e$)



Source: CCS calculations based on approach described in text.

See Section 4.30 for a discussion of the impacts of these potential greenhouse gas emissions on global climate change. Emissions of all regulated pollutants (including GHGs) and their impacts will be quantified and evaluated at the time that a specific development project is proposed.

4.2.1.3 Climate

The assessment of GHG emissions and climate change is in its formative phase. It is currently not feasible to know with certainty the net impacts from the proposed action on climate. The inconsistency in results of scientific models used to predict climate change at the global scale coupled with the lack of scientific models designed to predict climate change on regional or local scales, limits the ability to quantify potential future impacts of decisions made at this level. When further information on the impacts to climate change is known, such information would be incorporated into the BLM's planning and NEPA documents as appropriate.

4.2.1.4 Mitigation

The BLM holds regulatory jurisdiction over portions of natural gas and petroleum systems, identified in the EPA Inventory of US Greenhouse Gas Emissions and Sinks document. Exercise of this regulatory jurisdiction has led to development of "Best Management Practices (BMPs)" designed to reduce emissions from field production and operations. Analysis and approval of future development on the lease parcels would include applicable BMPs as Conditions of Approval (COAs) in order to reduce or mitigate GHG emissions. Additional measures developed at the project development stage would be incorporated as COAs in the approved APD or with a programmatic EIS, which are binding on the operator.

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;
- The use of 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 from the pads.

The EPA Inventory data show 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 (Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006). KFO, PFO, RFO, and RSFO 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.

4.2.2 Wildlife

Surface disturbing and/or disruptive activities on the parcels during the crucial big game wintering period could cause unnecessary impacts to wintering moose, mule deer, pronghorn,

and elk, such as causing animals to move to less suitable winter habitat and conceivably causing fetal abortion by pregnant females. As stated in Section 1.3, it is not possible at the lease offering stage to accurately predict whether a parcel would actually be leased; if it is leased, whether or not a given parcel would be explored or developed; and if explored or developed, what that level (down-hole and surface well pad spacing) will be. Should activity occur that is analogous to that occurring on Pinedale Anticline, it could be assumed that impacts similar to those shown in the Sawyer, Holloran, and Berger studies would occur. Surface disturbing or disruptive activities within big game migration routes during the migration period could result in animals altering their travel routes and expending energy needed during the winter season to avoid the activity.

4.2.2.1 Special Status Species

Under this alternative, 80 whole parcel and 10 partial parcels would be offered. Additionally, 32 partial parcels whole parcels and 10 would be deferred from the November 2011 oil and gas lease sale pending the Greater sage-grouse amendment to the Kemmerer, Pinedale, Rawlins, and Green River RMPs. Due to IM WY-2010-012 and IM WY-2010-013 the BLM is currently amending 6 RMPs across the state. The goal of the RMP amendments is to have a state-wide plan that is consistent with the Governor of Wyoming's Executive Order 2010-4, the IMs and to have stipulations match across field office boundaries in order to avoid a potential ESA listing of the Greater sage-grouse.

IM WY-2010-013 directs the BLM to screen each parcel for sage grouse core areas. Refer to the sage-grouse core area screen in Appendix B to see which parcels fall within core area and meet the manageability criteria identified in the IM. Post-lease projects within "core" would be analyzed as directed by IM WY-2010-012.

Portions or all of 61 parcels under Alternative B are located in Greater sage-grouse or potential Greater sage-grouse habitat. When development activities are proposed, the BLM will conduct a site-specific analysis of the proposal and the current key Greater sage-grouse habitat boundaries (such as the State of Wyoming Governor's Core Areas). Based on site-specific environmental analysis, 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 Wyoming Game and Fish Department Greater sage-grouse objectives. These measures may include, but are not limited to, disturbance density limitations or surface use and timing restrictions in proximity to certain habitats (e.g., severe winter relief habitat, Greater sage-grouse leks, etc.). Restrictions and prohibitions may be more restrictive than current RMP stipulation guidance if supported by site-specific NEPA analysis of a development proposal.

Forty-three parcels fall within a designated Greater sage-grouse key habitat area, but would not be deferred because they don't meet the manageability criteria in IM WY-2010-013 due to land ownership or existing development (including existing leases).

Surface disturbing and/or disruptive activities within 2 miles of a grouse lek or other known nesting habitats during the nesting period, within winter concentration areas, and/or within ¼ mile of leks during the breeding season could cause undue or unnecessary impacts to Greater sage-grouse. Impacts could include reduced breeding success and/or nest abandonment as well as causing the Greater sage-grouse to move to less suitable winter habitat. This would be the same for habitat within and outside key habitat areas. The private and state surface and/or

mineral estate within key habitat areas are not subject to BLM leasing or lease development regulations. As stated in Section 1.3, it is not possible at the lease offering stage to accurately predict whether a parcel will actually be leased; if it is leased, whether or not a given parcel would have exploration or development activities; and if explored or developed activity what that level (down-hole and surface well pad spacing) would be. Should activity occur that is analogous to that occurring on Pinedale Anticline, it could be assumed that impacts similar to those shown in the Halloran study could occur.

All other impacts are the same as those described in the Kemmerer, Pinedale, Rawlins, and Green River RMPs as they relate to Greater sage-grouse.

4.2.2.2 Other wildlife (Avian, Aquatic, and Terrestrial)

Post-lease actions (construction and drilling) during the plover breeding and nesting period (April 10 to July 10) in the vicinity of plover nests (if plovers actually inhabit any of the parcels) may cause unnecessary impacts to nesting birds, such as egg or hatchling abandonment. Operations during the breeding season could result in reduced breeding success. Conservation recommendations under the required biological opinion written by the USFWS on behalf of the endangered and sensitive Bear River, Platte River, and Colorado River fishes shall be adhered to.

Surface disturbing and/or disruptive activities from February 1 to July 31, or up to September 15th in the case of burrowing owls, may cause undue impacts to nesting raptors and/or burrowing owls if their presence is found. The primary impact would be from nesting disturbance which could result in nest abandonment, and/or increased egg and chick mortality. Studies have shown that some raptors, such as ferruginous hawks, golden eagles, bald eagles and red-tailed hawks, are more sensitive to vehicular traffic than others. Site-specific wildlife surveys would be developed at the APD stage.

Well-pad, road, and pipeline development into areas currently void of surface disturbance would result in habitat fragmentation, which depending on the intensity of the development, vegetative cover, and terrain could affect a variety of typically ground dwelling species, such as but not limited to Greater sage-grouse, Wyoming pocket gopher, mule deer, pronghorn, and elk. Should post-lease development actually occur on any of the parcels, the related surface disturbance would 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 ongoing until those portions of a well pad not needed for production operations, road disturbance outside the shoulders, and the pipeline disturbance are reclaimed. Long-term habitat loss would include those portions of the pad needed for production operations for the life of the well and travel path and shoulders of the access roads. Impacts of surface disturbing activities, such as oil and gas development to ground dwelling species including Wyoming pocket gopher could include direct habitat loss from new construction, behavioral changes from increased human activity and associated noise, and direct mortality associated crushing due to vehicular movements and construction activities.

Water depletions for well pad and road construction, well drilling, well completion operations, pipeline hydrostatic testing, and dust abatement would potentially reduce stream flows in the Bear, Colorado, and Platte River systems and could affect threatened and endangered fish species in those river systems. It could also result in some increased siltation. The depletion quantities would vary depending on the number of wells being drilled and completed and

whether or not non-contributing sources of water could be utilized. Any increased siltation would depend on the amount of surface disturbance, its proximity to live water, and erosion control measures implemented. All depletions in these river systems are subject the USFWS mitigation requirements (depletion fund payments); specific project proposals resulting in a may affect determination are required to undergo formal consultation with the USFWS before any project approval. Any lease-related construction activities in or through the riparian/surface water areas within a parcel could affect amphibian and reptilian species using those resources. Surface disturbance in or adjacent to or water extractions from Trout Creek and or Gooseberry Creek in parcel 068 would potentially affect the conservation population of Colorado River cutthroat trout in those streams through increased siltation and hydrocarbon/chemical spills.

4.2.2.3 Mitigation

As prescribed by the Kemmerer, Pinedale, Rawlins, and Green River RMPs, wildlife impacts at the leasing stage would be mitigated through seasonal restrictions and controlled surface use where applicable. See Table 4.1a, Parts 1 & 2 for a reference to the stipulations to be applied and to Appendix B for the specific wildlife stipulations applied to each parcel. Based on these stipulations, the impacts to wildlife identified in the governing RMPs/FEISs were determined not to be significant. This EA identifies similar impacts; ergo, implementation and adherence to these stipulations though this EA is expected to achieve analogous results. In the event, lease development is proposed, BMPs such as directional drilling, multiple wells per pad, well pad siting, etc. could be implemented to mitigate site-specific impacts to wildlife throughout their habitats, including but not limited to birth and crucial winter habitat, as well migration routes. Additionally, BLM would implement the guidelines in Wyoming Game and Fish Department's (WGFD) "Recommendations for Development of Oil and Gas Resources within Crucial and Important Habitat", (2010) to the extent practicable.

Water depletions would be mitigated through the payment to the depletion funds with FWS at the time of extraction. Impacts to streams, fisheries, riparian habitat, and aquatic species would mitigated though application of the requirements in lease notice 1. Spills would be mitigated through measures required through Spill Prevention Control and Countermeasure permit should development occur within a parcel. The controlled surface use stipulation is applied to all offer parcels and provides protection for current and future threatened, endangered, and special status species.

4.2.3 Lands with Wilderness Characteristics

Under this alternative, 80 whole parcels and 10 partial parcels would be offered. Additionally, 33 entire parcel and 8 partial parcels would be deferred from the November 2011 sale.

As stated in Section 3.2.2.3 above, at the the time of the draft EA release to the public for review and comment, parcels WY-1111-058-061, 063-065, 068-073, and 097-101 were determined to meet the LWC size requirement, but whether or not they meet the naturalness could not be determined without field inventory; hence these parcels were recommended to be deferred under Alternative B. But as further stated in Section 3.2.2.3, subsequent to the release of the draft EA, the Rock Springs Field Office completed the field inventory of parcel 068 and the Rawlins Field Office relocated a missing 2002 field inventory of the South Kinney Rim CWP that includes parcel 058-061 and 063-065. The field inventory for parcel 068 determined that the area west of County Road 34 does not have wilderness characteristics due to the extent of human made intrusions. The area east of County Road 34 was determined to meet the naturalness and

outstanding opportunity for solitude or a primitive and unconfined type of recreation. The 2002 inventory of the Kinney Rim South CWP determined that the "area does not have supplemental values. Due to the abundance of human impacts, the area was determined not to have wilderness characteristics." Parcels 069-071 and 097-101 are still pending field inventory and would be deferred from the November 2011 lease sale.

Offering parcels that have been determined to not contain wilderness characteristics and deferring the parcels needing field inventory (i.e., parcels 069-071 and 097-101) would not impact wilderness characteristics or preclude the BLM's ability to determine manageability for lands with wilderness characteristics during a land use planning process. Offering parcel 068 at the November 2011 lease would also not impact wilderness characteristics or preclude the BLM's ability to determine manageability for lands with wilderness characteristics during a land use planning process. As stated the portion of parcel 068 located west of Sweetwater County Road 034 was determined to be in an area that did not contain wilderness characteristics. The portion of parcel 068 east of County Road 034 lies within the Rubicon Federal Exploratory Oil and Gas Unit. Under a December 1, 2009 letter from the BLM Wyoming State Director to the Governor of Wyoming concerning unleased lands within the Little Mountain Ecosystem, "Any parcel nominated for oil and gas leasing located within a Federal oil and gas exploratory unit agreement would be offered for sale with the existing stipulations as defined for the area in accordance with the Green River RMP." Table 4-1 Parts 1 and 2 and Appendix B provide the stipulations based on the Green River RMP that would be applied to parcel 068. One of those stipulations is a Controlled Surface Use stipulation that provides for the protection of the Greater Red Creek ACEC, which would include the LWC values in the portion of the parcel east of the county road.

4.2.3.1 Mitigation

Application of the Controlled Surface Use stipulation to parcel 068 for protection of the Greater Red Creek ACEC.

4.2.4 Cultural and Paleontological Resources

Once the decision is made by the lessee to develop a lease, area specific cultural records review would be done to determine if there is a need for a detailed cultural inventory of those areas that could be affected by the subsequent surface disturbing activities. Generally, a cultural inventory will be required and all identified historic and archaeological sites that are eligible for listing in the National Register of Historic Places or potentially eligible to be listed would be either avoided by the undertaking or have the information in the sites extracted through archaeological data recovery before surface disturbance. The same basic process applies to paleontological resources. Offering lease parcels for sale would not, in and of itself, impact historic or prehistoric resources. Development within the viewshed of contributing segments of National Historic Trails could impact the trail setting.

4.2.4.1 Mitigation

Lease Notice No. 2 is applied to all parcels offered for leasing. Avoidance measures would be imposed wherever eligible cultural and/or paleontological resources are potentially impacted (refer to Table 4.1a and Appendix B for the parcels with cultural and historic stipulations).

4.2.5 Soils

The act of offering, selling, and issuing federal oil and gas leases does not produce impacts to soils. Subsequent development of the lease would physically disturb the topsoil and would expose the substratum soil on subsequent project areas. Direct impacts resulting from the oil and gas construction of well pads, access roads, and reserve pits include removal of vegetation, exposure of the soil, mixing of horizons, compaction, loss of top soil productivity and susceptibility to wind and water erosion. Wind erosion could be a moderate contributor to soil erosion given the average wind speeds in the area. Dust from vehicle traffic would also be a factor. Indirect impacts such as runoff, erosion and off-site sedimentation could result from construction and operation of well sites, access roads, gas pipelines and facilities.

Contamination of soil from drilling and production wastes mixed into soil or spilled on the soil surfaces could cause a long-term reduction in site productivity. Some of these direct impacts can be reduced or avoided through proper design, construction and maintenance, and implementation of best management practices.

Additional soil impacts associated with lease development would occur when heavy precipitation causes water erosion damage. When water saturated segment(s) of the access road become impassable, vehicles may still be driven over the road. Consequently, deep tire ruts would develop. Where impassable segments are created from deep rutting, unauthorized driving may occur outside the designated route of access roads. Unsuccessful reclamation could result in increased erosion and reduced soil productivity.

Based on the Kemmerer, Pinedale, Rawlins, and Green River RMPs, surface disturbance is restricted or prohibited on slopes over 25 percent and also within floodplains; consequently impacts to these resources/landforms are not anticipated from post-leasing development. The requirements in the BLM Wyoming Reclamation Policy would be implemented for all surface disturbing activities. In accordance with the policy additional pre-disturbance and pre-reclamation data may be required when soils with a low potential for reclamation are impacted.

4.2.5.1 Mitigation

The operator would stockpile the topsoil from the surface of well pads which would be used for surface reclamation of the well pads. The impact to the soil would be remedied upon reclamation of well pads when the stockpiled soil that was specifically conserved to establish a seed-bed is spread over well pads and vegetation re-establishes.

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

4.2.6 Vegetation

The act of offering, selling, and issuing federal oil and gas leases does not produce impacts to vegetation. Impacts to vegetation, both direct and indirect, would occur when the lease is

developed in the future. The potential impacts would be analyzed on a site specific basis before oil and gas development.

Should post-lease development actually occur on any of the parcels, the related surface disturbance would result in short-term and long-term losses of vegetation. Short-term vegetation loss would include all initial surface disturbance associated with the project until those portions of a well pad not needed for production operations, road disturbance outside the shoulders, and the pipeline disturbance are reclaimed. Long-term habitat loss would include those portions of the pad needed for production operations for the life of the well and travel path and shoulders of the access roads. Both short-term and long-terms losses of vegetation would result in a commensurate reduction foraging habitat available for wildlife and livestock. Also for wild horses in the wild horse management areas. Vegetation loss could also potentially correlate to a reduction in nesting habitat for ground nesting avian species, as well as a loss of hiding cover for certain avian and mammalian species.

All or portions of parcels 020 and 026 are located within the Blowout Penstemon ACEC for the endanged blowout penstemon in the Rawlins Field Office and parcel 079-087 contains portions of the Special Status Plants (SPS) Species ACEC for *Arabis pucilla, Astragalus proimanthus, Descurainia torula, Thelesperma, pubescens* in the Rock Springs Field Office. The objective for both ACECs is the prevent loss of plants and habitat and to insure continues existence of the species. Refer to the Rawlins RMP/FEIS, including the attached Biological Opinion from the US Fish and Wildlife Service for more information on the blowout penstemon and to the Green River RMP/FEIS and the Green River RMP/ROD for more information on the *Arabis pucilla, Astragalus proimanthus, Descurainia torula, Thelesperma, pubescens.*

Surface disturbance and increased dust or other pollutants within areas containing special status plant species result in the loss individual plants or groups of plants; however the species specific no surface occupancy stipulation and the special status species controlled surface use (CSU) stipulation prohibits or restricts activity in such areas; consequently impacts are expected to be negligible. The NSO for *Arabis pucilla, Astragalus proimanthus, Descurainia torula, Thelesperma, pubescens* meets the intent of providing maximum protection for the plant species while providing access to mineral resources.

4.2.6.1 Mitigation

Refer to Table 4.1a and Appendix B for parcels with the Special Status Species CSU stipulation. Additionally, the area within both ACECs are closed to surface occupancy and surface disturbing activities, such as lease mineral exploration and development activities and construction (i.e., NSO).

4.2.7 Invasive, Non-native Species

The act of offering, selling, and issuing federal oil and gas leases does not produce invasive/non-native species impacts. Subsequent development produces impacts in the form of surface disturbance. The construction of an access road and well pad may unintentionally contribute to the establishment and spread of noxious weeds. Noxious weed seed could be carried to and from the project areas by numerous methods, including construction equipment, the drilling rig and transport vehicles. The main mechanism for seed dispersion on the road and well pad is by equipment and vehicles that were previously used and or driven across or through noxious weed infested areas. The potential for the dissemination of invasive and noxious weed seed may be

elevated by the use of construction equipment typically contracted out to companies that may be from other areas.

4.2.7.1 Mitigation

In the event noxious weeds are discovered during construction of any access roads and well pads, measures will be taken to mitigate those impacts. Washing and decontaminating the equipment entering and exiting the construction areas would minimize this impact. Additionally, seed mixes used for reclamation are required to be certified weed-free and all Operators must have an approved Weed Management Plan.

4.2.8 Wastes, Hazardous or Solid

The lease parcels fall under environmental regulations that impact exploration and production waste management and disposal practices and impose responsibility and liability for protection of human health and the environment from harmful waste management practices or discharges.

Any potential for waste impact would not occur until post-lease development activities are initiated. Impacts could be in the form of drilling fluid spills, solid chemical spills, fuel spills, trash scatter on and off the well pads, and hydrocarbon or gas releases.

4.2.8.1 Mitigation

The lease sale parcels are regulated under the Resource Conservation and Recovery Act (RCRA), Subtitle C regulations, which are extremely stringent. As well as, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which provides for the exclusion of petroleum (including crude oil or any fraction thereof) from the definition of hazardous substance, pollutant, or contaminant. Additionally, waste management requirements are included in the 12 point surface use plan and the 9 point drilling plan attached to the APDs. Companies would be required to have approved Spill Prevention Control and Countermeasure Plans and comply with NTL-3A for reporting of undesirable events.

4.2.9 Water Quality: Surface and Groundwater

The act of offering, selling, and issuing federal oil and gas leases does not produce impacts to water quality. Subsequent development of the lease can lead to surface disturbance from the construction of well pads, access roads, pipelines, and powerlines, which can result in degradation of surface water quality and groundwater quality from nonpoint source pollution, point source pollution including spills, increased soil losses, and increased gully erosion. Surface disturbance associated with well-drilling (pad/road/pipeline construction) close to (less than 500 feet) to the wetland/riparian areas and/or floodplains discussed in the Affected Environment section could increase silt loads in these watercourses. Production facilities in floodplains could result in down channel hydrocarbon discharge during a flooding event. As required BLM would manage floodplains and activities within floodplains in accordance with Executive Order 11988.

Potential direct impacts that would occur due to construction of well pads, access roads, pipelines, and powerlines include increased surface water runoff and off-site sedimentation brought about by soil disturbance; increased salt loading and water quality impairment of surface waters; channel morphology changes due to road and pipeline crossings; and possible contamination of surface waters by produced water discharged at the surface, and uncontrolled and unremediated spills.

The magnitude of these impacts to water resources would depend on the proximity of the disturbance to the drainage channel, slope aspect, and gradient, degree and area of soil disturbance, soil character, duration and time within which construction activity would occur, and the timely implementation and success or failure of mitigation measures.

Direct impacts to surface water would likely be greatest shortly after the start of construction activities and would likely decrease in time due to natural stabilization, and reclamation efforts. Impacts to groundwater would be less evident and occur on a longer time scale. Construction activities would occur over a relatively short period; therefore, the majority of the disturbance would be short-term. Spills or produced fluids (e.g., saltwater, oil, fracking chemicals, and/or condensate in the event of a breech, overflow, or spill from storage tanks) could result in contamination of the soil onsite, or offsite, and may potentially impact surface and groundwater resources in the long term.

Petroleum products and other chemicals could result in groundwater contamination through a variety of operational sources including but not limited to pipelines, well (gas and water) construction, and spills. Similarly, improper construction and management of reserve and evaporation pits could degrade ground water quality through leakage and leaching. Authorization of the proposed projects would require full compliance with local, state, and federal directives and stipulations that relate to surface and groundwater protection. "The Duke researchers doing the hydro-fracturing study said the gas they found in water **is not coming up through rocks from the pressure of fracturing**…" (*NY Times/E&E News*, 5/9/11). "**The paper found no evidence of contamination from the chemicals used to fracture the rock** or from "produced" water — the wastewater that emerges from the wells after the shale has been fractured." (*AFP*, 5/10/11) .

Oil and gas wells are cased and cemented at a depth below all usable water zones; consequently impacts to water quality at springs and residential wells are not expected. However, faulty cementing or well casing could result in methane migration to upper zones. Some industrial water wells in the Pinedale Anticline and Jonah Fields have experienced detections of hydrocarbon in the water. Most of these detections were below the minimum concern levels (MCL) established by the Environmental Protection Agency. A few wells have exceeded the MCL and have or are undergoing voluntary remediation with the Wyoming Department of Environmental Quality. Studies to date have not concluded a definitive cause of the contaminations. Water wells developed for oil and gas drilling could result in a draw down in the quantity of water in the residential wells and at springs depending upon the geology; however it is not possible to predict whether or not such water wells would be developed at this point in time. Industrial water supply wells would require state permits and approval by the BLM at the APD stage; potential impacts would be mitigated at that time.

4.2.9.1 Mitigation

Lease Notice No. 1 is applied to all lease parcels and restricts surface disturbing activities within 500 feet of surface water and/or riparian areas to protect the water and riparian resources. The use of practices such as but not limited to closed-loop mud systems or plastic-lined reserve pits would reduce or eliminate seepage of drilling fluid into the soil and eventually reaching groundwater. The casing and cementing requirements imposed on proposed wells would reduce or eliminate the potential for groundwater contamination from drilling muds and other surface sources. Additional mitigation could include, but would not be limited to: the use of recycled

water for drilling below the surface casing zone, installation of backflow preventers, drilling oil and gas related water wells to aquifers below those providing residential water and then cementing from the nearest shale/clay zone below the deepest culinary/livestock water well in the vicinity back to the surface, and insuring that access to water wells is only provided to authorized users. By using the lowest quality water necessary and cementing the water well to surface will reduce the chances that oil and gas related water wells are not drawing from the aquifers providing the residential water or allowing the mixing of lower quality waters with potable sources. Additionally, when drilling with oil-based mud, or in areas where shallow groundwater may be encountered, the use of closed-loop or semi-closed loop drilling systems may be required. Floodplains would be managed in accordance with Executive Order 11988.

4.2.10 Watershed – Hydrology

The act of offering, selling, and issuing federal oil and gas leases does not produce impacts watersheds. Subsequent development of a lease may result in long term and short term alterations to the hydrologic regime. Peak flow and low flow of perennial streams, ephemeral, intermittent rivers and streams and their associate would be directly affected in the short-term by an increase in impervious surfaces resulting from the construction of the well pad and road. The potential hydrologic effect to peak flow is reduced infiltration where surface flows can move more quickly to perennial or intermittent/ephemeral rivers and streams, causing peak flow to occur earlier and to be larger. Increased magnitude and volume of peak flow can cause bank erosion, channel widening, downward incision, and disconnection from the floodplain. The potential hydrologic effect to low flow is reduced surface storage and groundwater recharge, resulting in reduced base flow to perennial and intermittent/ephemeral rivers and streams. The direct impact would be that hydrologic processes may be altered where the perennial, ephemeral, and intermittent river and stream system responds by changing physical parameters, such as channel configuration. These changes may in turn impact chemical parameters and ultimately the aquatic ecosystem.

Minor long-term direct and indirect impacts to the watershed and hydrology could continue for the life of surface disturbance from water discharge from roads, road ditches, and well pads, but would decrease once all well pads and road surfacing material has been removed and reclamation of well pads, access roads, pipelines, and powerlines has taken place. Interim reclamation of the portion of the well pad not needed for production operation, as well as revegetating the portion of the pad that is needed for production operations, as well as revegetating road ditches would minimize this long term impact. Short term direct and indirect impacts to the watershed and hydrology from access roads that are not surfaced with impervious materials would occur and would likely decrease in time due to reclamation efforts.

4.2.10.1 Mitigation

Stormwater Pollution Prevention and Control Plans are required by the State of Wyoming before any surface disturbance associated with construction actions greater than 1 acre in size. On a case by case basis, the Authorized Officer may require additional erosion control measures to reduce the volume of surface runoff and subsequent sediment transport. The operator would stockpile the topsoil from the surface of well pads which would be used for surface reclamation of the well pads. Reserve pits would be re-contoured and reseeded as described in the APD COA. Upon abandonment of the wells and/or when access roads are no longer in service the Authorized Officer would issue instructions and/or orders for surface reclamation/restoration of the disturbed areas as described in the APD COA. Implement interim reclamation BMP measures.

4.2.11 Livestock Grazing

The act of offering, selling, and issuing federal oil and gas leases does not produce impacts to livestock grazing. Subsequent development of a lease may generate impacts to livestock. Post-lease development would result in short-term and long-term losses of vegetation (see Section 4.7), which correlates to short-term and long-term losses of livestock forage. Short-term losses would be until the portions of a well pad not needed for production operations, road disturbance outside the shoulders, and the pipeline disturbance, are reclaimed with established vegetation. Long-term losses would be the portions of the pad needed for production operations for the life of the well, as well as the maintained portions of the access roads. Increased traffic associated with well-field development increases the possibility of animals being injured or killed in collisions with vehicles.

4.2.11.1 Mitigation

Reclaim and revegetate all disturbed areas not needed for well production operations. Avoid range improvements by 500 feet (standard lease term #1). Avoid of livestock trailing routes. Secure reserve pits and production facilities against livestock entry with cattleguards, fences and gates would reduce adverse effects to livestock.

4.2.12 Recreation

The act of offering, selling, and issuing federal oil and gas leases does not produce impacts to the recreational use of public land. Subsequent development of a lease may generate impacts to recreation activities. For public land areas that are small or land-locked by private or state land, recreation opportunities would be limited or non-existent due to land ownership or access restrictions. Recreational use on larger blocks of public land and on smaller blocks of public land where there is public access could be impacted by post-lease oil and gas development. The quality of the recreational experience would likely be diminished by oil and gas development operations. Recreation on split estate lands would be at the discretion of the private landowner.

Construction and drilling operations would potentially cause game animals and birds to move away from the activity. Studies have shown that animals have moved 2 miles or more from logging operations and other similar activities. If such post-lease development operations would coincide with hunting season, it is expected that hunters may experience reduced success rates within a 2-mile area of the activity. Hunting success could potentially increase in areas beyond the 2 miles. In addition to facilitating mineral extraction, new oil and gas roads would also provide better access to the lease areas for recreational opportunities but can also negatively influence poaching activities. However, the presence of oil and gas facilities would likely diminish the recreational experience. A decline in recreational use of an area due oil and gas development would potentially affect local, state, and regional revenues generated through the recreational. The level of economic decline would depend type and level of use and the level of decline. Section 3.2.2.10 provides some economic values derived from recreational use of the public lands.

4.2.12.1 Mitigation

Development activities would be restricted within ½ mile of developed recreation sites. Additional mitigation and/or COAs, such as additional seasonal restrictions or BMPs such as directional drilling, liquids gather systems, pad drilling, etc. could be identified at the development stage to further reduce impacts associated with oil and gas development.

4.2.13 Visual Resources

Visual resource management is broken into four VRM classes. The parcels addressed through Alternative B contain Classes II, III and IV.

The VRM Class II objective is to retain existing landscape character. 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. Modifications to a proposal would be required if the proposed change cannot be adequately mitigated to retain the character of the landscape. Depending on the production nature of the well site, multiple low-profile condensate and/or oil or produced water tanks would be necessary to accommodate the project.

The VRM Class III objective is to partially retain existing landscape character. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate a casual observer's view. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. Facilities, such as produced water, condensate or oil storage tanks that rise above eight feet, would provide a geometrically strong vertical and horizontal visual contrast in form and line to the characteristic landscape and vegetation, which have flat, horizontal to slightly rolling form and line. The construction of an access road, well pad and other ancillary facilities, other than facilities greater in height than thirteen feet, would slightly modify the existing area visual resources. Facilities, such as condensate and produced water or oil storage tanks that rise above thirteen feet, would provide a geometrically strong vertical and horizontal visual contrast in form and line to the characteristic landscape and vegetation, which have flat, horizontal to slightly rolling form and line.

The VRM Class IV objective is to provide for management activities which require major modification of the existing landscape character. Every attempt, however, should be made to reduce or eliminate activity impacts through careful location, minimal disturbance, and repeating the basic landscape elements. Facilities, such as condensate and produced water or oil storage tanks that rise above thirteen feet, would provide a geometrically strong vertical and horizontal visual contrast in form and line to the characteristic landscape and vegetation, which have flat, horizontal to slightly rolling form and line. The construction of an access road, well pad and other ancillary facilities would slightly modify the existing area visual resources.

Since well locations cannot be accurately determined at the leasing stage, it is not possible to accurately predict the visual impacts. Development intensity, terrain, and proximity to visual receptors (e.g., main travel corridors, towns, recreation facilities, etc.) will greatly influence the VRM impacts. For example, a single well pad screened by terrain at an area absent of visual receptors would have low to negligible impacts in Class III or IV areas; whereas well pads developed next to a major travel route on in the viewshed of a town or recreation facility may have substantial impact. It is possible that post-lease industrial development could result in portions or all of a VRM area to be downgraded to a lower classification.

4.2.13.1 Mitigation

The flat colors Shale Green, Covert Green, or Shadow Gray from the Standard Environmental Colors Chart would be used on all facilities to closely approximate the vegetation within the

setting. All facilities, including the meter buildings, would be painted one of these colors as determined during a site-specific review, unless other colors more closely match the surrounding landscape. Facility painting schemes also may include camouflage patterns or other management practices to reduce facility visibility or visual contrast in particularly sensitive areas. If the proposed area is in a scenic corridor use of landscape features for screening, use of low profile tanks, and/or offsite production may be recommended. A controlled surface use (CSU) stipulation would be applied to all parcels containing lands with a VRM Class II designation; see Table 4.1a and Appendix B. Additional measures may be required at the development stage.

4.2.14 Public Health and Safety

The act of offering, selling, and issuing federal oil and gas leases does not produce impacts to public health and safety. Subsequent development of a lease may generate impacts. Vehicle and equipment operations associated with the subsequent construction, drilling, and production operations could affect members of the public using the same roads and general areas. Releases of gas from the well bore, production facilities and spills could potentially adversely affect members of the public in the vicinity. The level of affect would depend on the product released or spilled, level of activity, density of development , technological controls, and the receptors susceptibility.

4.2.14.1 Mitigation

Prepare and implement safety contingency plans and comply with NTL-3A.

4.2.15 Socio-economics

Under this alternative, 80 parcels and 10 partial parcels would be offered for sale. Additionally, 32 entire parcel and 10 partial parcels would be deferred from the November 2011 sale. It is assumed that development of the offered leases would proceed at about the same rate of development that the Kemmerer, Pinedale, Rawlins, and Rock Springs Field Offices have experienced over the last ten years, i.e., about 690 wells spudded per year. Specific economic impacts would be identified in the NEPA document supporting the APD, when a more accurate analysis is possible based on the speculative nature of leasing in relation to development.

Residences near active drilling and completion operations would likely experience noise impacts.

4.2.15.1 Mitigation

Lease notice 1 restricts or prohibits surface disturbance within ¼ mile of occupied dwellings.

4.2.16 Environmental Justice

No minority or low income populations would be directly affected in the vicinity of the proposed actions from subsequent proposed oil or gas projects. Indirect impacts could include impacts due to overall employment opportunities related to the oil and gas and service support industry in the region, as well as the economic benefits to state and county governments related to royalty payments and severance taxes.

4.2.16.1 Mitigation

None.

4.2.17 Solid Leasable (Coal)

There are no impacts to coal from the offering and issuance of the lease parcels; however to ensure no conflicts arise, parcels WY-1111-010, 011, 014 and 103 are subject to the CSU for Coal/Oil and Gas Conflict Special Lease Stipulations for protecting the first in time valid existing rights of the lessee.

4.2.17.1 Mitigation

See Table 4.1a and Appendix B

4.2.18 Other Considerations per IM 2010-117 that Pertain to the Available.

A. There is a risk of drainage to Federal mineral resources due to development of nearby non-Federal parcels if the parcel is not leased.

Parcels WY-1111-001, 003-006, 008, 010-035, 039, 040, 043-046, 048-050, 053, 054, 056-113, 115, 116, 118, 119, and 122-125 are not near non-federal oil and gas development that would pose a drainage risk if the parcels were not leased. Parcels WY-1111-002, 007, 009, 036-038, 042, 047, 051, 052, 055, 114, 117, 120, and 121are near non-federal wells where drainage could potentially become an issue. None of the parcel proposed for deferral are in proximity of producing non-federal wells where drainage would be of concern. Note: Parcels 032 and 068 are within Federal exploratory units, but currently have no non-federal wells in their vicinity that would pose a drainage concern.

B. In undeveloped areas, are non-mineral resource values greater than potential mineral development values?

All of parcels addressed in this EA have multiple surface resource values (see the affected environment discussions above). Whether the surface resource values for a given parcel are greater or less than the potential oil and gas development potential is subjective. Persons interested in preserving the surface resources would very likely say those values are greater than the potential mineral development value; whereas somebody interested in securing and developing one of the leases would likely say that the mineral value is greater. The Kemmerer, Pinedale, Rawlins, Green River RMPs have addressed values of the lands containing the parcels in this EA and have made resource allocations. Parcels 041, 054, 078, and part of 042 fell within areas where the surface resource values were determined to be greater than the mineral resource values, hence these parcel are not available to be offered for lease. The rest of the parcels fall in areas that are available for oil and gas leasing. This doesn't mean mineral development was given a higher priority. All of the parcels have stipulations intended to mitigate impacts to the surface resource values. The private surface within parcels 003 and 007 belonging to Elk Mountain Ranch (owned by Iron Bar LLC) is encumbered by a Conservation Easement granted to the Nature Conservancy. The easement is not binding on the federal surface or the federal mineral estate within the parcels; however development on the leases could reduce the effectiveness of the easement's objectives. A special lease notice is attached to both parcels to alert potential lessees to the Conservation Easements existence and encouraging them to coordinate and cooperate with the Iron Bar LLC and the Nature Conservancy to maintain the integrity of the easement.

C. Stipulation constraints in existing or proposed leases make access to and/or development of the parcel or adjacent parcels operationally infeasible, such as an NSO parcel blocking access to parcels beyond it or consecutive and overlapping timing restrictions that do not allow sufficient time to drill or produce the lease without harm to affected wildlife resources.

Parcels 041, 054, 078, and part of 042 are not available for leasing. Parcels 001, 002, 062, 066, 093, 094, 117, and 119 do not have seasonal timing limitation stipulations. The rest of the parcels have one or more timing limitation stipulations. The vast majority of the parcels have multiple timing limitation stipulations that restrict activity from November 15 through July 31. Oil and gas operators have successfully conducted operations within the portion of the year falling outside these restrictions for the past 2 to 3 decades.

D. Parcel configurations would lead to unacceptable impacts to resources on the parcels or on surrounding lands and cannot be remedied by reconfiguring.

While there are a number of parcels that have one or more disconnected components, accessing and developing would not result in any impacts beyond those addressed in this EA, The EA has not identified any unacceptable/unmitigatable impacts from the configuration of those parcels with disconnected components, nor has it identified that there would be unacceptable/unmitigatable from all or portions of a parcel.

E. The topographic, soils, and hydrologic properties of the surface will not allow successful final landform restoration and revegetation in conformance with the standards found in Chapter 6 of the Gold Book, as revised.

A number of the parcels have areas with slopes greater than 25 percent. Construction on such slopes would increase the difficulty of achieving successful reclamation and landform restoration; however standard lease stipulations restrict or prohibit occupation on these slopes. Additionally, parcels with these slopes also have areas with lesser slopes that are suitable for construction where there would be a high potential for successful reclamation. Many of the parcels fall within the 7 to 9 inch annual precipitation range. These drier sites also hamper successful reclamation, but there are procedures, such as strategic irrigation, hydro-mulching, etc. available to assist with achieving the Gold Book reclamation standards.

F. Construction and use of new access roads or upgrading existing access roads to an isolated parcel would have unacceptable impacts to important resource values.

Parcel 001 is adjoined by Albany County Roads 143 and 234. Parcel 002 is bisected by Albany County Road 128. Parcel 003 is within ½ mile of Carbon County Road #404 and State Highway 72. Parcel 004, 006, and 007 are bisected by State Highway 72. Parcel 005 is bisected by I-80. Parcel 008 is bisected by Carbon County Road 291. Parcel 009 is within ½ mile of Carbon County Road 291 and is bisected by a constructed road. Parcels 010, 011, and 014 are accessed by coal mine roads and a railroad spur. Parcel 12 is bisected by the UP Railroad and associated access roads. Parcel 13 is within 1.5 miles of coal mine roads and is bisected by two-track roads. Parcel 015 is bisected by an upgraded road to Seminoe Reservoir. Parcel 016 and 019 are bisected/adjoin I-80. Parcels 017 and 018 are bisected by an upgraded mining exploration road. Parcels 020-035 are in an area bounded on the north

by Carbon County Road 100, on the west by Highway 287, and are bisected by pipeline rights-of-way and numerous oil and gas exploration and development roads. Parcel 036 adjoins State Highway 70 and Carbon County Roads 561 and 601. Parcel 037 adjoins Carbon County Roads 561, 706, and 752. Parcel 038 adjoins Carbon County Road 561. Parcels 039 and 040 adjoin Carbon County Roads 602 and 752. Parcel 041 is not available for lease. Parcel 042 is within .75 miles of Carbon County Road 605N. Parcels 048, 050, 051, and 052 adjoin Carbon County Roads 503. Parcels 043 and 044 are bisected by two upgraded roads. Parcels 045 and 046 are bisected by Highway 287. Parcels 049 and 053 adjoin the Muddy Mountain/Deep Creek Road. Parcel 054 is not available for lease. Parcel 055 is bisected by an Atlantic Rim oil and gas access road. Parcel 056 adjoins 2 upgraded access roads. Parcel 057 is in the Atlantic Rim natural gas field. Parcel 058, 060, and 061 are in the DRUA a mile to a mile and a half from the nearest upgraded road; however they are bisected by at least one two-track. Parcels 059 and 063 are both approximately 4 miles from the nearest upgraded road, but they also are bisected by at least one two-track. Parcels 062, 064, 065, and 066 are bisected by an upgraded interconnect between BLM Roads 4407 and 4412. Parcel 067 adjoins State Highway 430. Parcel 068 is bisected by Sweetwater County Road 34. Parcels 069-073 are located are 3 to 7 miles north of Sweetwater County Road 49 and 4 to 8 miles west of Highway 191; however there 2 reclaimed roads to plugged and abandoned well pads within the parcels that could be reconstructed. Parcels 074-076 are flanked by existing gas field operations associated with the Jonah and Pinedale Anticline Fields. Parcel 077 is bisected by BLM Road 4315. Parcel 078 is not available for oil and gas leasing. Parcels 079-087 are bounded on the east by Sweetwater County Road 1, on the north by a powerline right-of-way on the south by State Highway 414 and on the west by BLM Roads 4314 and 4316. Road 4314 also passes through portions of parcels 081, 084, 085, and 086. Parcel 088 is bisected by an upgraded road to the Hickey Mountain radio towers. Parcel 089 is bisected by State Highway 414. Parcel 090 is ¼ mile from BLM Road 4319 and ¼ mile for a well pad access road. Parcel 091 is bisected by an upgraded well pad access road. Parcel 092 is bisected by a powerline and a pipeline, but the nearest upgraded road is about a mile away (the terrain is suitable for construction). Parcels 093, 094, and 096 are bisected by or adjoin Lincoln County Road 319. Parcel 095 is bisected by Highway 189. Parcel 097-101, 103, and 105-107 adjoin, are within ¼ mile, or are bisected by Lincoln County Road 306. Parcel 102 is less than ¼ mile of a railroad grade and within ½ mile of an upgraded mine access road. Parcel 104 is bisected by Lincoln County Road 233 and an additional upgraded road. Parcels 108, 112, and 115 are bisected by Highway 189. Parcel 109-111 are bisected by or adjoin BLM Road 4306 and an additional upgraded road (part of 111 is within ¼ mile of Highway 189). Parcel 113 is bisected by an upgraded road and is within a mile of highway 189. Parcel 114 is bisected by the Skull Point Coal mine access road and railroad. Parcels 116 and 119 are bisected by an access road to a reclaimed by pad and is within a mile of another upgraded road. Parcel 117 is bisected by BLM Road 4308 and parcel 118 is bisected by BLM Road 4306. Parcels 120 and 121 are bisected by oil and gas development access roads. Parcel 122 adjoins I-180 and the Evanston Airport, and is bisected by the airport access road. Parcel 123 is ½ mile north of the Evanston Airport and is within ½ mile of 2 upgraded roads. Parcel 124 is less than ¼ mile from State Highway 89. Parcel 125 adjoins or is within ¼ of an oil and gas development access road.

G. Leasing would result in unacceptable impacts to the resources or values of any unit of the National Park System or national wildlife refuge.

None of the parcels are within the proximity of a National Park or National Wildlife Refuge. Parcel WY-1111-104 is approximately 6 miles east of the Fossil Butte National Monument. The area between parcel 104 and the Monument contains numerous existing oil and gas leases.

H. Leasing would result in unacceptable impacts to specially designated areas (whether Federal or non-Federal) and would be incompatible with the purpose of the designation.

Parcels 041, 054, 078, and portions of parcel 042 fall within Special Management Areas (SMA) or ACEC designated by the Pinedale or Rawlins RMPs. These SMAs/ACECs are unavailable for leasing and are being deleted. Parcels 058, 059, 060, 061, 063, 064, and 065 fall within the DRUA established through the Rawlins RMP. Parcel 068 is located in the Greater Red Creek ACEC.

4.3 Impacts of Alternative C (Maximum Parcel Offering)

Alternative C would have essentially the same impacts as those described for the Proposed Action. The primary difference between the alternatives is that Alternative C would offer 122 parcels for lease sale versus 80 entire and 10 partial parcels under Alternative B. Table 4.1a shows the resources and corresponding stipulations/mitigation that are to be applied to the Alternative C parcels. Alternative C would result in the offering of additional parcels located Greater sage-grouse key habitat areas ; if sold they could potentially be subjected to post-lease disturbance and associated impacts, resulting in a potential loss of Greater sage-grouse key habitats and precluding the management of such for conservation efforts. Alternative C would result in more acreage being offered for lease than Alternative B would. This would potentially result in more wells and surface disturbance, and a commensurately higher emissions discharge to the atmosphere if development was to be deemed viable. Alternative C would also result in areas that may contain lands with wilderness characteristics being leased, which could impact or impair those characteristics. A loss of Greater sage-grouse key habitat area and/or wilderness characteristics could result in an irretrievable commitment of a resource. Additionally, it would result in parcel WY-1111-075 containing the Rocks Archaeological District and the portion of parcel WY-1111-112 containing the Bridger Antelope Trap being leased, which would deprive Native American tribes the opportunity to request additional mitigation to protect the cultural values at those sites that are important to the tribes being included as lease stipulations.

4.4 Cumulative Impacts

Offering the subject parcels for lease, and the subsequent issuance of leases, in and of itself, would not result in any cumulative impacts. The referenced RMPs/EISs provide cumulative affects analysis for oil and gas development based on the reasonable, foreseeable oil and gas development scenario. This analysis is here by incorporated by reference. The offering of the proposed lease parcels is consistent with that analysis. As discussed in Section 1.3, it is assumed that any development on those leases would occur within the RDF level analyzed in the EISs for the governing RMPs and that the impacts would also be within the thresholds of identified in the EISs. And as stated in Section 1.1, “The mitigation measures developed through those EISs reduced/minimized the anticipated impacts associated with the projected development to acceptable levels below the significance threshold”; therefore, since the proposed parcels are within areas designated by the RMPs as available for oil and gas leasing and development and as such are a subset of the RMP, it is anticipated that this will also hold evident for the parcels. As depicted through research on the Pinedale Anticline, it is conceivable that

environmental impacts associated with development within a given parcel could be higher or lower than those anticipated in the EISs; however across the spectrum of the parcels proposed for offer it is anticipated on average impacts would be within the range analyzed in the EISs. Again, it is important to emphasize that at the leasing stage is not possible to predict if a parcel would be leased; if it is leased whether or not it would be developed; and if it isdeveloped at what intensity/spacing. Which is why additional NEPA is required when a definitive development proposal is received.

Subsequent to the issuance of the RMPs, additional projects, such as the Gateway West, TransWest, and Gateway South transmission lines, as well as the Chokecherry-Sierra Madre, Sand Hills Ranch, and White Mountain Wind Energy Development Projects, and the Normally Pressured Lance Oil and Gas Development Project have arisen. The EISs/EAs being prepared for those projects will address the cumulative effects of those individual projects in conjunction with each other and other ongoing projects. As stated Section 1.3, additional site-specific NEPA analysis will be conducted in the event a development proposal is submitted for one or more of the parcels addressed in this EA. This site-specific analysis will address the cumulative effects of that development in conjunction with other project within the cumulative affects area.

The following provides cumulative impacts information related to Air Quality/Green House Gases/Climate Change: There are approximately 13,300 federal producing wells in the High Desert District (5000 in Rawlins FO, 900 in Kemmerer FO, 2700 in Rock Springs FO, and 4700 in Pinedale FO). Of this number, approximately 424 wells (3.2%) are coal-bed methane wells. Analysis of cumulative impacts for RFD of oil and gas wells on public lands is included in the Kemmerer, Pinedale, Rawlins, and Green River RMPs. Potential development of all available federal minerals in the field offices, including those in the proposed lease parcels, was included as part of the analysis.

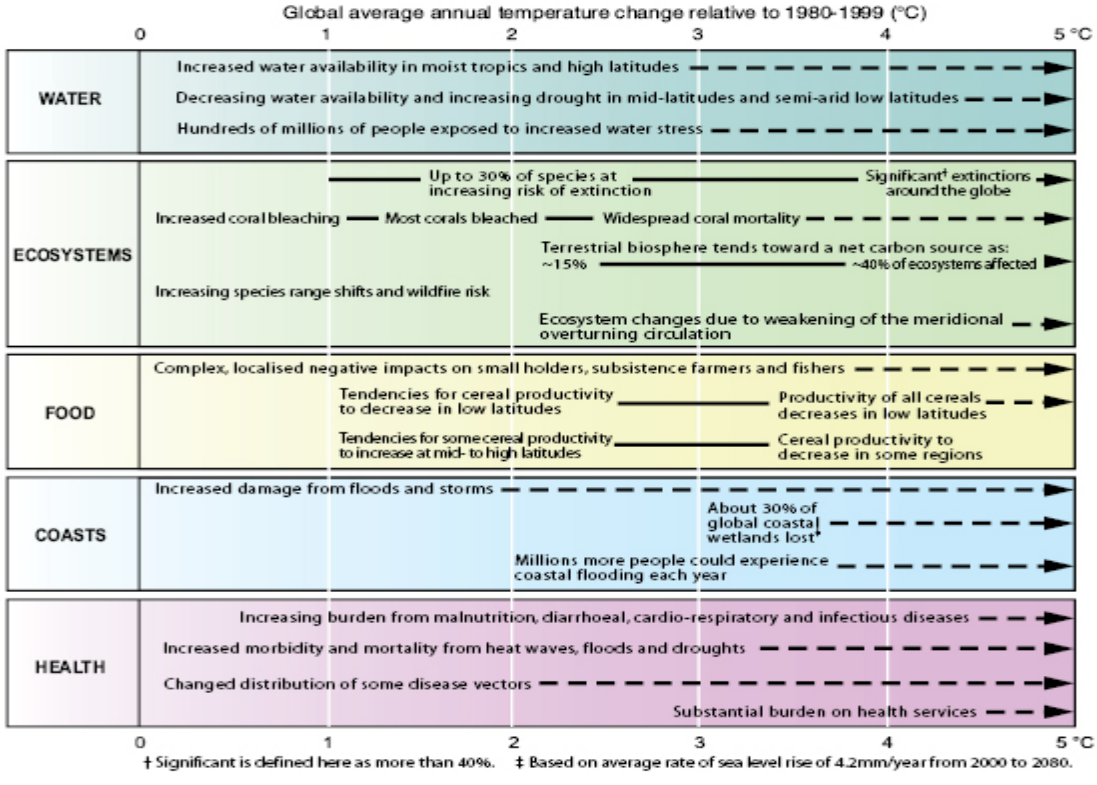
As described in the analysis of environmental consequences, the proposed action and/or the alternative may contribute to the effects of climate change through GHG emissions. However, it is not currently possible to associate any of these particular actions with the creation of any specific climate-related environmental effects. The lack of scientific tools designed to predict climate change at regional or local scales limits the ability to quantify potential future impacts.

The assessment of greenhouse gas emissions and climate change is still in its formative phase; therefore, it is not yet possible to know with confidence the net impact on climate. However, the Intergovernmental Panel on Climate Change (IPCC 2007) recently concluded that “warming of the climate system is unequivocal” and “most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic [man-made] GHG concentrations.” As the temperatures of the land and sea change, environmental factors such as weather patterns, sea levels, precipitation rates, the timing of the seasons, desert distribution, forest cover, and ocean salinity will also change. These changes influence the world’s climate systems and will have different impacts to different areas. Some agricultural regions may become more arid while others become wetter; some mountainous areas will experience greater summer precipitation, yet experience disappearing snowpack. Wildlife responses to such environmental changes, such as alteration of migration routes or timing, expansion or contraction of suitable habitat, changes in predatory or foraging habits, or changes in reproductive habits or fecundity may occur but cannot be predicted.

The average number of oil and gas wells drilled annually in the HDD and probable GHG emission levels, when compared to the total GHG emission estimates from the total number of federal oil and gas wells in the state, represent an incremental contribution to the total regional and global GHG emission levels. This incremental contribution to global GHG gases cannot be translated into incremental effects on climate change globally or in the area of these site-specific actions. As oil and gas and natural gas production technology continues to improve in the future, one assumption is that it may be feasible to further reduce GHG emissions.

Based on research compiled for the International Panel on Climate Change Fourth Assessment Report, 2007, potential effects of climate change on resources in the affected environment are likely to be varied. Figure 4.4.1, taken from the Fourth Assessment Report indicates varying responses of the natural world to increasing temperatures as a result of increasing global temperatures.

Figure 4.4.1: Examples of impacts associated with global average temperature change (Impacts will vary by extent of adaptation, rate of temperature change and socio-economic pathway).



Within North America, the report specifically forecasts that: Warming in western mountains is projected to cause decreased snowpack, more winter flooding and reduced summer flows, exacerbating competition for over-allocated water resources; in the early decades of the century, moderate climate change is projected to increase aggregate yields of rain-fed agriculture by 5 to 20%, but with important variability among regions; major challenges are projected for crops that are near the warm end of their suitable range or which depend on highly utilized water resources; cities that currently experience heat waves are expected to be further challenged by an increased number, intensity and duration of heat waves during the course of the century, with potential for adverse health impacts and coastal communities and habitats will be increasingly stressed by climate change impacts interacting with development and pollution. Specific modeling and/or

assessments of the potential effects for the HDD and for the State of Wyoming currently do not exist.

In 2001, the Intergovernmental Panel on Climate Change (IPCC) pointed out that by the year 2100, global average surface temperatures would increase 2.5 to 10.4°F above 1990 levels (IPCC 2007). The National Academy of Sciences (2006) has confirmed these findings, but also indicated that there are uncertainties regarding how climate change may affect different regions. Computer model forecasts indicate that increases in temperature will not be evenly or equally distributed, but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be greater than during the summer, and increases in daily minimum temperatures is more likely than increases in daily maximum temperatures.

Regarding the linkage between climate change related warming and associated impacts, an assessment of the IPCC states that difficulties remain in attributing observed temperature changes at smaller than continental scales. Therefore, it is currently beyond the scope of existing science to predict climate change on regional or local scales resulting from specific sources of GHG emissions. Emissions of all regulated pollutants (including GHGs) and their impacts will be quantified and evaluated at the time that a specific development project is proposed.

IPCC also discloses that significant uncertainties remain with respect to the estimates of the current level of emissions and projections of future production of fossil fuels as the oil and gas industry is difficult to forecast with the mix of drivers: economics, resource supply, demand, and regulatory procedures. The assumptions used for the projections, based on recent trends or State production trends in the near-term, and AEO 2006 growth rates through 2020, 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.

5.0 Description of Mitigating Measures and Residual Impacts

The lease sale will be mitigated by attaching appropriate conditions of approval to any subsequent requests for lease development either on a case by case basis or upon receipt of a project proposal (see Table 4.1a and Appendix B). The KFO, PFO, RFO, and RSFO Surface Use and Occupancy Requirements, Conditions of Approval, and the Special Leasing Stipulations as specified in the respective RMPs provide adequate mitigation for issuance of all lease parcels under the Proposed Action.

Direct, indirect, cumulative and residual impacts of leasing and lease development are generally described in the Kemmerer, Pinedale, Rawlins, and Green River RMP FEISs and RODs. An environmental analysis will be prepared on a case-by-case basis upon receipt of future subsequent actions.

6.0 Consultation/Coordination

WYOMING GAME AND FISH DEPARTMENT (WGFD)

The Rawlins Field Office solicited comments on their respective lease parcels from the following WGFD personnel on February 14, 2011: Martin Hicks, Rich Guenzel, Greg Hyatt, Terry Creekmore, Mark Zornes, Will Shultz, and Tony Mong. RFO received a response from Rich Guenzel concurring with the stipulation recommendations for parcel WY-1111-003 through 007. RFO has received no other WGFD comments.

The Kemmerer Field Office solicited comments on their respective lease parcels from Mark Zornes on February 23, 2011. On February 24th, they received a general comment/question on the Greater sage-grouse core area screening process and whether or not BLM had a specific core area stipulations. KFO responded on the 25th that BLM Wyoming is currently operating under IM WY-2010-013 which does not provide any specific core area stipulations. KFO also stated that lease notice 3 for Greater sage-grouse and Greater sage-grouse habitat protection is attached to every parcel. Mr. Zornes has not provided any parcel specific comments.

Pinedale FO coordinated their respective parcels with Therese Hartman WGFD liaison stationed in the Pinedale Field Office. Therese concurred with the Field Office's stipulation recommendations.

Rock Springs Field Office submitted a review and comment request to Patrick Burke at the WGFD Green River Office on February 22, 2011, but received no comments.

NATIVE AMERICAN
Native American consultation has been initiated by the Kemmerer Field Office for the Bridger Antelope Trap in parcel WY-1111-112 and by the Pinedale Field Office for the Rocks Archaeological District in parcel WY-1111-075.

6.1 List of Preparers/Reviewers

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KEMMERER FIELD OFFICE

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Dennis Doncaster	Hydrologist
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Kellie Roadifer	Environmental Planning Coordinator
Sam Drucker	Paleontologist
Rob Schweitzer	Archaeologist
Summer Schulz	Range Management Specialist
Travis Ames	Range Management Specialist/Weed Coordinator
Martin Hudson	Outdoor Recreation Planner
John Huston	Assistant Field Manager for Natural Resources
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Tim Zebulske	Natural Resource Specialist
Shane DeForest	Field Manager

HIGH DESERT DISTRICT OFFICE

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Jake Vialpando	Resource Advisor for Biological Resources

WYOMING STATE OFFICE BLM

Julie Weaver	Supervisory Mineral Leasing Specialist

Merry Gamper	Physical Scientist
Chris Carlton	Planning and Environmental Coordinator

7.0 References

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