

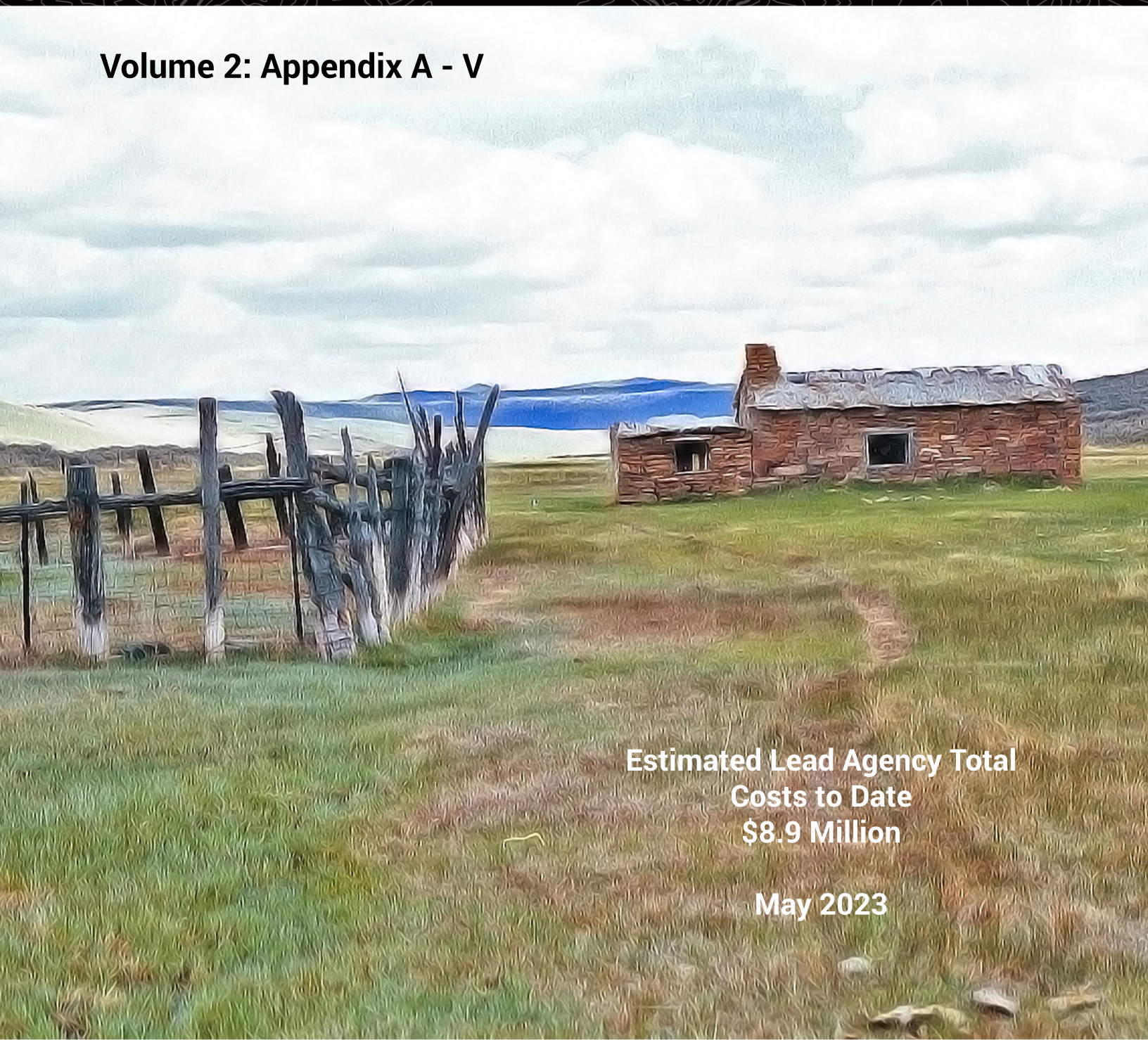


U.S. Department of the Interior  
Bureau of Land Management

# Rock Springs Field Office

Draft Resource Management Plan Revision and Draft  
Environmental Impact Statement

Volume 2: Appendix A - V



Estimated Lead Agency Total  
Costs to Date  
\$8.9 Million

May 2023

### BLM MISSION

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

DOI-BLM-WY-D040-2011-0001-RMP-EIS

# **Rock Springs Field Office**

**Draft Resource Management Plan Revision**

**and**

**Draft Environmental Impact Statement**

**April 2023**

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# APPENDIX A—PROJECT DESIGN FEATURES AND BEST MANAGEMENT PRACTICES

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## A.1 PROJECT DESIGN FEATURES

### A.1.1 Introduction

Project design features establish specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each project design feature cannot be fully assessed until the project level when the project location and design are known. Because of site-specific circumstances, some project design features may not apply to some projects (e.g., a resource is not present on a given site) and/or may require slight variations (e.g., a larger or smaller protective area). All variations of project design features would require that at least one of the following be demonstrated in the National Environmental Policy Act of 1969 (NEPA) analysis associated with the project/activity:

- A specific project design feature is documented to not be applicable to the site-specific conditions of the project/activity (e.g., due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that a project design feature be varied or rendered inapplicable.
- Through the coal planning process, it will be determined if areas are suitable for further coal leasing consideration. The coal planning process (see 43 CFR 3420.1-4 and 43 CFR 3461) will identify areas where coal leasing is not suitable or acceptable and those areas will be removed from further coal consideration for coal leasing and development (i.e., they will not be leased, so no development and no further protection needed).

Mines (particularly large surface coal mines) do not have the flexibility to move operations, so it is assumed that if a lease is ultimately offered, sold, and issued, the federal coal lessee can use the entire coal lease for mining operations once they receive their federal permit. The following measures would be applied as project design features for all solid minerals. The measures would also apply to locatable minerals subject to valid existing rights and consistent with applicable law.

### A.1.2 Project Design Features for Lands and Realty, Range Management, Fluid Minerals, Coal Exploration, Wild Horses, Vegetation Management, Wildfire and Fuels Management, and Noise

Priority Habitats: Project design features and best management practices (BMP) are continuously improving as new science and technology become available and therefore are subject to change. Include from the following project design features those that are appropriate to mitigate effects from the approved action.

- When possible, require perch deterrents on existing or new overhead facilities. Encourage installation of perch deterrents on existing facilities.
- Where existing leases or rights-of-way (ROW) have had some level of development (road, fence, well, etc.), and are no longer in use, reclaim the site by removing these features and restoring the habitat.
- Work cooperatively with permittees, lessees, and other landowners to develop grazing management

strategies that integrate both public and private lands into single management units.

Coordinate project design features, BMPs, and vegetative objectives with the Natural Resources Conservation Service (NRCS) for consistent application across jurisdictions where the BLM, Forest Service, and NRCS have the greatest opportunities.

- Evaluate the role of existing seedings that are currently composed of primarily introduced perennial grasses. If these seedings are part of an Allotment Management Plan/Conservation Plan, then no restoration would be necessary. Assess the compatibility of these seedings as a component of a grazing system during land health assessments (Davies et al. 2011). For example, some introduced grass seedings are an integral part of a livestock management plan and reduce grazing pressure or serve as a strategic fuels management area.
- Where the federal government owns the surface, and the mineral estate is in non-federal ownership, apply appropriate BMPs to surface development.

### **A.1.3 Roads**

Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.

Locate roads to avoid important areas and habitats.

Coordinate road construction and use among federal fluid mineral lessees and ROW or special use authorization (SUA) holders.

Construct road crossings of ephemeral, intermittent, and perennial streams to minimize impacts to the riparian habitat, such as by crossing at right angles to ephemeral drainages and stream crossings.

Establish trip restrictions (Lyon and Anderson 2003) or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).

Do not issue ROWs or SUAs to counties on energy development roads, unless for a temporary use consistent with all other terms and conditions including this document.

Designate all newly constructed routes for authorized use only (using signage, gates, etc.).

Apply dust abatement on roads, well pads, and other surface disturbances.

Close and rehabilitate duplicate roads by restoring original landform and establishing desirable habitat conditions.

### **A.1.4 Operations**

Conduct reclamation on unused roads as soon as possible. Reclaim the permitted ROWs used in the construction of the running surface immediately.

Site and/or minimize linear ROWs or SUAs to reduce disturbance and fragmentation of sagebrush habitats.

Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.

Bury distribution power lines to the extent technically feasible.

Cover all fluid-containing pits and open tanks with netting (maximum 1.5-inch mesh size).



Equip tanks and other above-ground facilities with structures or devices that discourage nesting and perching of raptors and corvids.

Control the spread and effects of invasive non-native plant species (Evangelista et al. 2011), including treating weeds prior to surface disturbance and washing vehicles and equipment at designated wash stations when constructing in areas with weed infestations.

Clean up refuse (Bui et al. 2010).

Eliminate sumps.

Cluster disturbances, operations (hydraulic fracture stimulation, liquids gathering, etc.), and facilities. If the geology is exploratory and there is the potential that subsequent wells may not be drilled, do not disturb additional habitat until geology has proven additional wells can go on the pad and it is necessary to do so.

Use directional and horizontal drilling to the extent feasible as a means to reduce surface disturbance in relation to the number of wells.

Place infrastructure in already disturbed locations where the habitat has not been fully restored.

Apply a phased development approach with concurrent reclamation.

Place liquid gathering facilities outside priority areas. To reduce truck traffic and perching and nesting sites for ravens and raptors, do not place tanks at well locations within priority habitat areas.

Pipelines must be under or immediately adjacent to the road (Bui et al. 2010).

Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use (Lyon and Anderson 2003).

Restrict the construction of tall facilities, distribution power lines, and fences to the minimum number and amount needed.

Use only closed-loop systems for drilling operations, with no reserve pits.

Consider using oak (or other material) mats for drilling activities where topography permits to reduce vegetation disturbance and for temporary roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.

### **A.1.5 Noise**

Limit noise to less than 10 decibels above ambient measures (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Patricelli et al. 2010, Blickley et al. 2012).

Require noise shields when drilling during the lek, nesting, brood-rearing, or wintering season.

Locate new compressor stations outside priority habitats and design them to reduce noise that may be directed towards priority habitat.

## **A.1.6 Reclamation**

Include objectives for ensuring habitat restoration in reclamation practices/sites. Address post-reclamation management in reclamation plan such that goals and objectives are to protect and improve habitat needs.

Maximize the area of interim reclamation on long-term access roads and well pads, including reshaping, topsoiling, and revegetating cut-and-fill slopes where practicable; material used for irrigation must be removed thereafter.

Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.

Implement irrigation during interim or final reclamation for sites where establishment of seedlings has been shown or is expected to be difficult due to dry conditions.

Use mulching, soil amendments, and/or erosion blankets to expedite reclamation and to protect soils.

Identify and work with partners to increase native seed availability and work with plant material centers to develop new plant materials.

Consider potential changes in climate (Miller et al. 2011) when proposing seedlings using native plants. Consider seed collections from the warmer component within a species' current range for selection of native seeds (Kramer and Havens 2009).

Use Ecological Site Descriptions (ESD) or other protocols (e.g., Terrestrial Ecological Unit Inventory or Lands System Inventory) to identify the understory species and sagebrush subspecies needed to restore desirable habitat conditions.

## **A.1.7 Vegetation Treatments/Fire and Fuels Management**

During vegetation management project design, consider the utility of using livestock to strategically reduce fine fuels (Diamond et al. 2009), and implement grazing management that will accomplish this objective (Davies et al. 2011, Launchbaugh et al. 2007). Consult with ecologists to minimize impacts to native perennial grasses.

Provide planning vegetation treatments information to personnel on habitat requirements, and identification of areas utilized locally.

Use vegetation treatment prescriptions that minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable plant species and reduce risk of hydrophobicity).

Design vegetation treatments in areas of high fire frequency which facilitate firefighter safety, reduce the potential acres burned and the fire risk to habitat. Additionally, develop maps for habitat which spatially display existing fuels treatments that can be used to assist suppression activities.

Restore prior perennial grass/shrub plant communities infested with invasive species to a species composition characterized by perennial grasses, forbs, and shrubs as outlined in ESDs.

Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.

Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species into habitats. This could be minimized by planting perennial vegetation (e.g., green-strips) paralleling road ROWs.

Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, and strictly

managed grazed strips) to aid in controlling wildfire, should wildfire occur near key habitats or important restoration areas (such as where investments in restoration have already been made).

As appropriate, utilize existing fuel breaks, such as roads or discrete changes in fuel type, as control lines to minimize the spread of fire.

Design vegetation treatments in habitats to strategically reduce wildfire threats in the greatest area. This may involve spatially arranging new vegetation treatments with past treatments, vegetation with fire-resistant serial stages, natural barriers, and roads in order to constrain fire spread and growth. This may require vegetation treatments to be implemented in a more linear versus block design (Launchbaugh et al. 2007).

Design post-Emergency Stabilization and Rehabilitation (ES&R) and Burn Area Emergency Rehabilitation (BAER) management to ensure long-term persistence of seeded or pre-burn native plants. This may require temporary or long-term changes in livestock grazing, wild horses, etc., to achieve and maintain the desired condition of ES&R and BAER projects.

Make reestablishment of sagebrush and desirable understory plant cover (relative to ecological site potential) a high priority for restoration efforts. Write specific vegetation objectives to reestablish sagebrush cover and desirable understory cover.

Where applicable, design fuels treatment objectives to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns which most benefit habitat.

Provide training to fuels treatment personnel on habitat requirements, and identification of areas utilized locally.

Use burning prescriptions which minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of annual grass invasion).

Ensure proposed sagebrush treatments are planned with full interdisciplinary input from the BLM (pursuant to NEPA) and coordination with state fish and wildlife agencies, and that treatment acreage is conservative in the context of surrounding seasonal habitats and landscape.

Power-wash all vehicles and equipment involved in vegetation treatment and fuels management activities prior to entering the area to minimize the introduction of undesirable and/or invasive plant species.

Give priority for implementing specific habitat restoration projects in annual grasslands, first to sites which are adjacent to or surrounded by priority/core habitat or that reestablish continuity between priority habitats. Annual grasslands are a second priority for restoration when the sites are not adjacent to priority/core habitat but within two miles of priority/core habitat. The third priority for annual grassland habitat restoration projects is sites beyond two miles of priority/core habitat. The intent is to focus restoration outward from existing, intact habitat.

As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs or one of those referenced in land use planning documentation.

Design fuel treatments that would increase fire suppression efficiencies to protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas. Where applicable, incorporate roads and natural fuel breaks into fuel break design.

Develop state-specific reference information and resource materials containing maps, a list of resource advisors, contact information, local guidance, and other information relevant to agency administrators and fire suppression resources.

During periods of multiple fires, ensure line officers are involved in setting priorities.

Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics.

Assign a resource advisor with expertise or who has access to all extended attack fires in or near habitat. Prior to the fire season, provide training to resource advisors on wildfire suppression organization, objectives, tactics, and procedures to develop a cadre of qualified individuals. Involve state wildlife agency expertise in fire operations through the following:

- Instructing resource advisors during preseason trainings
- Qualification as resource advisors
- Coordination with resource advisors during fire incidents
- Contributing to incident planning with information such as habitat features or other key data useful in fire decision making.

On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in habitat areas.

Locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas and heli-bases) in areas where physical disturbance to habitat can be minimized. These include disturbed areas, grasslands, near roads/trails, or other areas where there is existing disturbance or minimal sagebrushcover.

Minimize unnecessary cross-country vehicle travel during fire operations in habitat.

Minimize burnout operations in key habitat areas by constructing a direct fire line whenever safe and practical to do so.

Utilize retardant, mechanized equipment, and other available resources to minimize burned acreage during initial attack.

As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.

Adequately document the fire operation activities in habitat for potential follow-up coordination activities.

Compile the District/Forest-level information into state-wide tool boxes. Tool boxes will contain maps, a listing of resource advisors, contact information, local guidance, and other relevant information for each District/Forest, which will be aggregated into a state-wide document.

## **A.2 BEST MANAGEMENT PRACTICES**

The BMPs shown in this appendix are not intended to encompass all potentially applicable BMPs. Instead, Appendix L was developed to address specific issues brought forward during scoping, alternative development, and comments from the public and cooperating agencies.

### **A.2.1 Best Management Practices for Important Cultural Resource and Trail Settings**

The BLM should use standard measures to reduce the visual impact of proposed actions within trail settings,

where setting is a contributing element of eligibility to the National Register of Historic Places and the setting has integrity. Standard measures should be used as stipulations or conditions of approval attached to authorizations. Standard measures, or BMPs, for reducing the visibility of proposed actions include, but are not limited to:

- Apply a controlled surface use stipulation to surface-disturbing activities or surface occupancy
- Visual Contrast Ratings and, as appropriate, require visual simulations
- Consolidate project facilities among oil and gas developers; maximize use of existing locations
- Develop coordinated road and pipeline systems
- Reduce the amount of surface development by consolidating facilities
- Use low profile facilities
- Locate projects to maximize the use of topography and vegetation to screen development
- Design projects to blend with topographic forms and existing vegetation patterns
- Use environmental coloration or camouflage techniques to reduce the visual impact of facilities that cannot be completely hidden
- Use broken linear patterns for road developments to screen roads as much as possible. This can include feathering or blending of the edges of linear ROWs to soften the dominant line form
- For livestock control, use electric fencing with low-visibility fiberglass posts and environmental colors
- Design linear facilities and seismic lines to run parallel to key observation points rather than perpendicular
- Position facilities to present less of a visual impact (e.g., a facility with several tanks lined up so that one obscures the visibility of the others).

### **A.2.2 Decontamination Procedure for Aquatic Invasive Species**

To prevent the spread of aquatic invasive species, the Wyoming Game and Fish Department recommends following the guidelines outlined in the *Aquatic Invasive Species in Wyoming* brochure. Specific BMPs to aquatic invasive species spread prevention include, but are not limited to:

Decontamination should first occur before arrival at a project site, so aquatic invasive species are not transferred from the last visited area. Decontamination should occur again before leaving a project site, so aquatic invasive species are not transferred to the next site.

- Decontamination may consist of either:
  - Drain all water from equipment and compartments, clean equipment of all mud, plants, debris, or animals, and dry equipment for five days in summer (June, July, and August); 18 days in spring (March, April, and May) and fall (September, October, and November); or three days in winter (December, January, and February) when temperatures are at or below freezing
  - Use a high pressure (2,500 pounds per square inch [psi]) hot water (140°F) pressure washer

to thoroughly wash equipment and flush all compartments that may hold water.

### **A.2.3 Wyoming Forestry Best Management Practices**

The Wyoming Forestry Best Management Practices: Forestry BMPs Water Quality Protection Guidelines (link below) describes BMPs for the management of forest lands. These BMPs are a set of voluntary preferred methods of forestland management designed to protect water quality and forest soils, and are intended for use on non-industrial private, forest industry, state-owned and federal forests. <http://wsfd.wyo.gov/forest-management/bmp-s>

### **A.2.4 Reseeding Best Management Practices**

The following recommendations may be required depending on the project size and location:

- Proposed actions where native brush species located on lands proposed to be disturbed are unique and desirable for interim and final reclamation purposes, and the seed supply for these desirable brush species is not commercially available, will be collected from the area and stored using the procedures of the Seeds of Success program. Seedlings or plugs of common dominant species will be propagated, preferably locally, in preparation for use in portions of area to be reclaimed to expedite vegetation recovery.
- Areas of sustainable plant communities and populations (where they do not conflict with other allowable resource uses) will be identified as sources for native plant material and will be managed under consideration of the need to consistently produce seed stocks of noncommercially available materials for use in reclamation and restoration work (e.g., to support reclamation of abandoned mine lands or well pads or to supplement commercially available seeds in high fire years).

### **A.2.5 Engineering Best Management Practices**

Road maintenance, construction, and any other related travel will be mandated by BLM Manual 9113. BLM Manual 9113 provides for BMPs to be used in evaluating, maintaining, and constructing BLM travel and transportation routes. As stated in Manual 9113, “Bureau roads must be designed to an appropriate standard no higher than necessary to accommodate their intended functions adequately (timber hauling administrative access, public travel); and design, construction, and maintenance activities must be consistent with national policies for safety, aesthetics, protection and preservation of cultural, historic, and scenic values, and accessibility for the physically handicapped. The following is a list of BMPs that are recommended but not binding for road maintenance practices:

Design roads to minimize total disturbance, to conform with topography, and to minimize disruption of natural drainage patterns.

- Base road design criteria and standards on road management objectives such as traffic requirements of the proposed activity and the overall transportation plan, economic analysis, safety requirements, resource objectives, and minimizing damage to the environment.
- Locate roads on stable terrain such as ridge tops, natural benches, and flatter transitional slopes near ridges, and valley bottoms, and moderate side slopes and away from slumps, slide prone areas, concave slopes, clay beds, and where rock layers dip parallel to the slope. Locate roads on well-drained soil types; avoid wet areas when possible.
- Construct, cut, and fill slopes to be approximately three horizontal (h):one vertical (v) or flatter where feasible. Locate roads to minimize heights of cutbanks. Avoid high, steeply sloping cutbanks in highly fractured bedrock.
- Avoid headwalls, midslope locations on steep, unstable slopes, fragile soils, seeps, old landslides,

side slopes in excess of 70%, and areas where the geologic bedding planes or weathering surfaces are inclined with the slope. Implement extra mitigation measures when these areas cannot be avoided.

- Construct roads for surface drainage by using outslopes, crowns, grade changes, drain dips, waterbars, and in-sloping to ditches as appropriate.
- Sloping the road base to the outside edge for surface drainage is normally recommended for local spurs or minor collector roads where low-volume traffic and lower traffic speeds are anticipated. This is also recommended in situations where long intervals between maintenance will occur and where minimum excavation is wanted. Out-sloping is not recommended on steep slopes. Sloping the road base to the inside edge is an acceptable practice on roads with steep side slopes and where the underlying soil formation is very rocky and not subject to appreciable erosion or failure.
- Crown and ditching is recommended for arterial and collector roads where traffic volume, speed, intensity and user comfort are considerations. Recommended gradients range from 0% to 15% where crown and ditching may be applied, as long as adequate drainage away from the road surface and ditch lines is maintained.
- Minimize excavation, when constructing roads, through the use of balanced earthwork, narrowing road widths, and end hauling where side slopes are between 50% and 70%.
- If possible, construct roads when soils are dry and not frozen. When soils or road surfaces become saturated to a depth of three inches, BLM-authorized activities should be limited or ceased unless otherwise approved by the Authorized Officer.
- Consider improving inadequately surfaced roads that are to be left open to public traffic during wet weather with gravel or pavement to minimize sediment production and maximize safety.
- Retain vegetation on cut slopes unless it poses a safety hazard or restricts maintenance activities. Roadside brushing of vegetation should be done in a way that prevents disturbance to root systems and visual intrusions (i.e., avoid using excavators for brushing).
- Retain adequate vegetation between roads and streams to filter runoff caused by roads.
- Avoid riparian/wetland areas where feasible; locate in riparian/wetland areas only if the roads do not interfere with the attainment of resource objectives.
- Minimize the number of unimproved stream crossings. When a culvert or bridge is not feasible, locate drive-through (low water crossings) on stable rock portions of the drainage channel. Harden crossings with the addition of rock and gravel if necessary. Use angular rock if available.
- Locate roads and limit activities of mechanized equipment within stream channels to minimize their influence on riparian areas. When crossing a stream is necessary, design the approach and crossing perpendicular to the channel, where practicable. Locate the crossing where the channel is well defined, unobstructed, and straight.
- Avoid placing fill material in floodplains unless the material is large enough to remain in place during flood events.
- Use drainage dips instead of culverts on level 2 roads where gradients will not present a safety issue. Locate drainage dips in such a way so that water will not accumulate or where outside berms prevent drainage from the roadway. Locate and design drainage dips immediately upgrade of

stream crossings and provide buffer areas and catchment basins to prevent sediment from entering the stream.

- Construct catchment basins, brush windrows, and culverts in a way to minimize sediment transport from road surfaces to stream channels. Install culverts in natural drainage channels in a way to conform with the natural streambed gradients with outlets that discharge onto rocky or hardened protected areas.
- Design and locate water crossing structures in natural drainage channels to accommodate adequate fish passage, provide for minimum impacts to water quality, and to be capable of handling a 100-year event for runoff and floodwaters.
- Use culverts that pass, at a minimum, a 25-year storm event or have a minimum diameter of 24 inches for permanent stream crossings and a minimum diameter of 18 inches for road cross drains.
- Replace undersized culverts and repair or replace damaged culverts and downspouts. Provide energy dissipaters at culvert outlets or drainage dips.
- Locate culverts or drainage dips in such a manner as to avoid discharge onto unstable terrain such as headwalls or slumps. Provide adequate spacing to avoid accumulation of water in ditches or road surfaces. Culverts should be placed on solid ground to avoid road failures.
- Proper sized aggregate and riprap should be used during culvert construction. Place riprap at culvert entrances to streamline waterflow and reduce erosion.
- Establish adapted vegetation on all cuts and fill immediately following road construction and maintenance.
- Remove berms from the downslope side of roads, consistent with safety considerations.
- Leave abandoned roads in a condition that provides adequate drainage without further maintenance. Close abandoned roads to traffic. Physically obstruct the road with gates, large berms, trenches, logs, stumps, or rock boulders as necessary to accomplish permanent closure.
- Abandon and rehabilitate roads that are no longer needed. Leave these roads in a condition that provides adequate drainage. Remove culverts.
- When plowing snow for winter use of roads, provide breaks in snow berms to allow for road drainage. Avoid plowing snow into streams. Plow snow only on existing roads.
- Maintenance should be performed to conserve existing surface material, retain the original crowned or out-sloped self-draining cross section, prevent or remove rutting berms (except those designed for slope protection) and other irregularities that retard normal surface runoff. Avoid wasting loose ditch or surface material over the shoulder where it can cause stream sedimentation or weaken slump-prone areas. Avoid undercutting back slopes.
- Do not disturb the toe of cut slopes while pulling ditches or grading roads. Avoid sidecasting road material into streams.
- Grade roads only as necessary. Maintain drain dips, waterbars, road crown, in-sloping and outsloping, as appropriate, during road maintenance.

- ~~Maintain roads in special areas according to special area guidance. Generally, retain roads within~~



existing disturbed areas and sidecast material away from the special area.

- When landslides occur, save all soil and material usable for reclamation or stockpile for future reclamation needs. Avoid sidecasting of slide material where it can damage, overload, and saturate embankments, or flow into down-slope drainage courses. Reestablish vegetation as needed in areas where vegetation has been destroyed due to sidecasting.
- Strip and stockpile topsoil ahead of construction of new roads, if feasible. Reapply soil to cut and fill slopes prior to revegetation.

## A.2.6 Best Management Practices for Livestock Grazing

The purpose of this section is not to attempt to select certain practices and require that only those be used. It is not possible to evaluate all the known practices and make determinations as to which are best. What is best must be determined as a result of a site-specific investigation of the proposed management action. No one management practice is best suited to every site or situation. BMPs must be adaptive and monitored regularly to evaluate effectiveness.

The following sources contain information regarding grazing BMPs. Over time, other sources of information will become available and will be considered in proposed management actions.

1. The National Range and Pasture Handbook

<http://www.glti.nrcs.usda.gov/technical/publications/nrph.html>

2. Best Management Practices for Grazing

<http://deq.state.wy.us/wqd/watershed/Downloads/NPS%20Program/92602.pdf>

## A.2.7 Best Management Practices for Visual Resources

The following BMPs would be considered to reduce impacts to all visual resource management classes within the planning area:

- Burying of distribution power lines and flow lines in or adjacent to access roads
- Repeating elements of form, line, color, and texture to blend facilities and access roads with the surrounding landscape
- Painting all above-ground structures, production equipment, tanks, transformers, and insulators not subject to safety requirements to blend with the natural color of the landscape, using paint that is a non-reflective “standard environmental color” approved by the BLM visual resource management specialist: All new equipment brought onto the sites should be painted the same color(s)
  - Semi-gloss paints will stain and fade less than flat paints
  - Typically, the background is a vegetated background, and seldom a solid background
  - The selected color should be one or two shades darker than the background
  - Consider the predominant season of public use; however, never paint an object to match snow

original contour or a contour that blends with the surrounding topography

- Avoiding facility placement on steep slopes, ridge tops, and hilltops
- Screening facilities from view
- Following contours of the land to reduce unnecessary disturbance
- Recontouring and revegetating disturbed areas to blend with the surrounding landscape
- Reclaiming unnecessary access roads as soon as possible to the original contour
- Using gravel of a similar color to adjacent dominant soil and vegetation colors for road surfacing
- Use dust abatement to reduce fugitive dust, as well as minimize the light colors of the routes
- Avoiding locating pads in areas visible from primary roads
- Using subsurface or low-profile facilities to prevent protrusion above horizon line when viewed from any primary road
- Co-locating wells when possible
- Locating facilities far enough from the cut and fill slopes to facilitate recontouring for interim reclamation
- Locating wells away from prominent features, such as rock outcrops
- Completing an annual transportation plan for an entire area before beginning construction and making a layout that will minimize disturbance and visual impact
- Designing and constructing all new roads to a safe and appropriate standard “no higher than necessary” to accommodate their intended use
- Locating roads far enough off the back of ridgelines so they aren’t visible from state, county, or BLM roads
- Using remote monitoring to reduce traffic and road requirements
- Removing unused equipment, trash, and junk immediately.

**Wind:**

- Considering topography when siting wind turbines
- Clustering or grouping turbines to break up overly long lines of turbines
- Creating visual order and unity among turbine clusters
- Siting wind turbines to minimize shadow flicker
- Relocating turbines to avoid visual impacts
- Using audio visual warning system (AVWS) technology to reduce night sky impacts
- Creating visual uniformity in shape, color, and size

- Using fewer, larger turbines
- Using non-reflective coatings on wind turbines and other facility components
- Prohibiting commercial messages and symbols on wind turbines
- Keeping wind turbines in good repair
- Cleaning nacelles and towers.

**Solar:**

- Developing a glint and glare assessment, mitigation, and monitoring plan
- Using dry-cooling technology for CSP facilities
- Siting and operate solar collectors to avoid offsite glare
- Screening solar collectors to avoid off-site glare
- Using color-treated solar collectors and support structures
- Maintaining color-treated surfaces of solar collectors
- Avoiding complete removal of vegetation beneath solar collector array
- Prohibiting commercial messages and symbols on solar power towers and solar collector arrays.

**Geothermal:**

- Using dry-cooling technology
- Screening pipelines from roads and other sensitive viewpoints
- Painting or coat aboveground pipelines
- Minimizing drill rig and well test facility lighting.

## **A.2.8 Best Management Practices for Water Resources**

BMPs would be appropriate for consideration to mitigate potential water quality impacts when proposed oil and gas activities are within 500 feet of riparian areas and surface waters of the state, Source Water Protection Areas identified in Wellhead, or Source Water Protection Plans approved by the local governing body, and “High” and “Moderately High” sensitivity aquifers (identified throughout the use of the Wyoming Groundwater Vulnerability Assessment Handbook (as updated over time). BMPs to mitigate impacts to water resources include, but are not limited to, the following:

- Those management approaches for oil and gas activities required by Source Water and Wellhead Protection Plans approved by the local governing body
- Use closed loop drilling systems
- Do not use evaporation ponds in proximity to shallow aquifers
- Do not use unlined ponds or pits overlying sensitive aquifers

- Line surface impoundment ponds (evaporation ponds or drilling pits) with synthetic liners and subsequently decommission them by removing all contaminants and liner and reclaiming the area
- Identify water supply wells and implement appropriate protection measures for the affected aquifer(s) as necessary to prevent the introduction of contaminants into the well
- Require a monitoring plan which includes collection of baseline and periodic water quality data from potentially affected water supply wells, identification of parameters to monitor, reporting results to BLM and well owners, and reporting to Wyoming Department of Environmental Quality-Air
- Review the geology of shallow aquifers to determine well construction requirements, which may include cementing to surface and drilling with a fresh water mud system
- Requirement for surface casing and cement to a specific formation or depth to protect aquifers at depth that need protection:
  - Set surface casing below the lowermost underground sources of drinking water and set into a confining (e.g., shale) layer
  - Set an intermediate string of casing and cement in the event of deep aquifers
  - Require submittal of a well logging plan and document submittal of plan to ensure proper well construction to protect groundwater. If a lost circulation event occurs during the installation of surface casing, a cement bond log will be required to be run on the surface casing to determine if the cement is adequate and protective.
  - Review the geology of shallow aquifers in proximity to groundwater development activities to determine potential impacts to flow patterns supporting water elements such as fen, wetlands, springs, and seeps, and ponds.

### **A.2.9 Reducing Impacts from Fluid Mineral Construction, Operation, and Reclamation**

The following BMPs would be considered to reduce impacts from fluid mineral construction, operation, and reclamation:

- Directional drilling
- Drilling of multiple wells from a single pad
- Transportation planning (to reduce road density and traffic volumes)
- Remote well monitoring
- Piping of produced liquids to centralized tank batteries offsite to reduce traffic to individual wells
- Submersible pumps
- Belowground wellheads
- Bussing of workers (to reduce traffic volume)

- Flareless well completions
- Pitless drilling
- Burying of distribution power lines and flow lines in or adjacent to access roads
- Design and construction of all new roads to a safe and appropriate standard “no higher than necessary” to accommodate their intended use
- Reuse of old roads or pads
- Interim reclamation of well locations and access roads soon after the well is put into production
- Avoidance of facility placement on steep slopes, ridge tops, and hilltops
- Storage of chemicals within secondary containment in case of a spill
- Onsite bioremediation of oil field wastes and spills
- Removal of trash, junk, waste, and other materials not in use.

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## **APPENDIX B—STIPULATIONS: EXCEPTION, MODIFICATION, AND WAIVER CRITERIA**

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### **INTRODUCTION**

This appendix lists by alternative, the stipulations on oil and gas leases referenced in Chapter 2 of this draft Resource Management Plan (RMP) and draft Environmental Impact Statement (EIS). Three types of surface stipulations can be applied to oil and gas leases to protect identified resource values: (1) no surface occupancy (NSO), (2) timing limitation stipulations (TLS), and (3) controlled surface use (CSU).

- **No Surface Occupancy:** Use of occupancy of the land surface for fluid mineral exploration or development is prohibited to protect identified resource values.
- **Timing Limitation:** Prohibits surface use during specified time periods to protect identified resource values. This stipulation does not apply to the operation and maintenance of production facilities unless the findings of analysis demonstrate the continued need for such mitigation and that less stringent, project specific mitigation measures would be insufficient.
- **Controlled Surface Use:** Use and occupancy is allowed (unless restricted by another stipulation) but identified resource values require special operational constraints that may modify the lease rights. CSU is used for operating guidance, not as a substitute for the NSO or TLS.

The BLM may apply TLS and CSU restrictions, as conditions of approval (COA) on an Application for Permit to Drill (APD) consistent with lease rights. The criteria for exceptions to COAs on APDs are the same as that for leasing in Table 2-4 (Appendix Z). Additionally, COAs on APDs do not apply to other portions of the leases such as maintenance and operation of existing facilities.

The RMP serves as the vehicle for explaining the conditions under which waivers, exceptions, or modifications of lease stipulations may be granted.

#### **Lease Notices**

A lease notice provides more detailed information concerning limitations that already exist in law, lease terms, regulations, or operational orders. A lease notice also addresses special items the lessee should consider when planning operations, but does not impose new or additional restrictions (Uniform Format for Oil and Gas Lease Stipulations, March 1989. Rocky Mountain Regional Coordinating Committee). “An information [lease] notice has no legal consequences, except to give notice of existing requirements, and may be attached to a lease by the authorized officer (AO) at the time of lease issuance to convey certain operational, procedural or administrative requirements relative to lease management within the terms and conditions of the standard lease form. Information [lease] notices shall not be a basis for

denial of lease operations (43 Code of Federal Regulations [CFR] 3101.1-3).” There are three standard lease notices that are attached to every lease issued by the BLM within Wyoming.

### **LEASE NOTICE NO. 1**

Under Regulation 43 CFR 3101.1-2 and terms of the lease (BLM Form 3100-11), the authorized officer may require reasonable measures to minimize adverse impacts to other resource values, land uses, and users not addressed in lease stipulations at the time operations are proposed. Such reasonable measures may include, but are not limited to, modification of siting or design of facilities, timing of operations, and specification of interim and final reclamation measures, which may require relocating proposed operations up to 200 meters, but not off the leasehold, and prohibiting surface disturbance activities for up to 60 days.

The lands within this lease may include areas not specifically addressed by lease stipulations that may contain special values, may be needed for special purposes, or may require special attention to prevent damage to surface and/or other resources. Possible special areas are identified below. Any surface use or occupancy within such special areas will be strictly controlled or, if absolutely necessary, prohibited. Appropriate modifications to imposed restrictions will be made for the maintenance and operation of producing wells.

1. Slopes in excess of 25%.
2. Within 500 feet of surface water and/or riparian areas.
3. Construction with frozen material or during periods when the soil material is saturated or when watershed damage is likely to occur.
4. Within 500 feet of Interstate highways and 200 feet of other existing rights-of-way (i.e., U.S. and state highways, roads, railroads, pipelines, powerlines).
5. Within 0.25 mile of occupied dwellings.
6. Material sites.

### **GUIDANCE:**

The intent of this notice is to inform interested parties (potential lessees, permittees, operators) that when one or more of the above conditions exist, surface-disturbing activities will be prohibited unless or until the permittee or the designated representative and the surface management agency (SMA) arrive at an acceptable plan for mitigation of anticipated impacts. This negotiation will occur prior to development and become a condition for approval when authorizing the action. Specific threshold criteria (e.g., 500 feet from water) have been established based upon the best information available.

However, geographical areas and time periods of concern must be delineated at the field level (i.e., "surface water and/or riparian areas" may include both intermittent and ephemeral water sources or may be limited to perennial surface water).



The referenced oil and gas leases on these lands are hereby made subject to the stipulation that the exploration or drilling activities will not interfere materially with the use of the area as a materials site/free use permit. At the time operations on the above lands are commenced, notification will be made to the appropriate agency. The name of the appropriate agency may be obtained from the proper BLM Field Office.

THIS NOTICE APPLIES TO ALL PARCELS.

## **LEASE NOTICE**

### **NO. 2**

#### **BACKGROUND:**

The BLM, by including National Historic Trails within its National Landscape Conservation System, has recognized these trails as national treasures. Our responsibility is to review our strategy for management, protection, and preservation of these trails. The National Historic Trails in Wyoming, which include the Oregon, California, Mormon Pioneer, and Pony Express Trails, as well as the Nez Perce Trail, were designated by Congress through the National Trails System Act (Public Law [P.L.] 90-543; 16 United States Code [U.S.C.] 1241-1251) as amended through P.L. 106-509 dated November 13, 2000.

Protection of the National Historic Trails is normally considered under the National Historic Preservation Act (NHPA) (P.L. 89-665; 16 U.S.C. 470 et seq.) as amended through 1992 and the National Trails System Act.

Additionally, Executive Order 13195, "Trails for America in the 21st Century," signed January 18, 2001, states in Section 1: "Federal agencies will...protect, connect, promote, and assist trails of all types throughout the United States. This will be accomplished by: (b) Protecting the trail corridors associated with national scenic trails and the high priority potential sites and segments of national historic trails to the degrees necessary to ensure that the values for which each trail was established remain intact."

Therefore, the BLM will be considering all impacts and intrusions to the National Historic Trails, their associated historic landscapes, and all associated features, such as trail traces, grave sites, historic encampments, inscriptions, natural features frequently commented on by emigrants in journals, letters and diaries, or any other feature contributing to the historic significance of the trails. Additional National Historic Trails will likely be designated amending the National Trails System Act. When these amendments occur, this notice will apply to those newly designated National Historic Trails as well.

#### **STRATEGY:**

The BLM will proceed in this objective by conducting a viewshed analysis on either side of the designated centerline of the National Historic Trails in Wyoming, except, at this time, for the Nez Perce Trail, for the purpose of identifying and evaluating potential impacts to the trails, their associated historic landscapes, and their associated historic features. Subject to the viewshed analysis and archeological inventory, reasonable mitigation measures may be applied. These may include, but are not limited to, modification of siting or design of facilities to camouflage or otherwise hide the proposed operations within the viewshed. Additionally, specification of interim and final reclamation measures may require relocating the proposed operations within the leasehold. Surface-disturbing activities will be analyzed in accordance with the National Environmental Policy Act (NEPA) of 1969 (P.L. 91190; 42

U.S.C. 4321-4347) as amended through P.L. 94-52, July 3, 1975 and P.L. 94-83, August 9, 1975, and the NHPA, supra, to determine if any design, siting, timing, or reclamation requirements are necessary. This strategy is necessary until the BLM determines that, based on the results of the completed viewshed analysis and archeological inventory, the existing land use plans (RMP) have to be amended. The use of this lease notice is a predecisional action, necessary until final decisions regarding surface-disturbing restrictions are made. Final decisions regarding surface-disturbing restrictions will take place with full public disclosure and public involvement over the next several years if BLM determines that it is necessary to amend existing land use plans.

**GUIDANCE:**

The intent of this notice is to inform interested parties (potential lessees, permittees, operators) that when any oil and gas lease contains remnants of National Historic Trails, or is located within the viewshed of a National Historic Trails' designated centerline, surface-disturbing activities will require the lessee, permittee, operator or, their designated representative, and the SMA to arrive at an acceptable plan for mitigation of anticipated impacts. This negotiation will occur prior to development and become a condition for approval when authorizing the action.

**THIS NOTICE APPLIES TO ALL PARCELS.**

The following three stipulations are applied to all BLM-administered fluid mineral leases within Wyoming.

**LEASE STIPULATION NO. 1: CULTURAL RESOURCES**

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

**LEASE STIPULATION NO. 2: ENDANGERED SPECIES ACT SECTION 7 CONSULTATION**

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

### LEASE STIPULATION NO. 3: MULTIPLE MINERAL DEVELOPMENT

Operations will not be approved which, in the opinion of the authorized officer, would unreasonably interfere with the orderly development and/or production from a valid existing mineral lease issued prior to this one for the same lands.

### EXCEPTIONS, MODIFICATIONS, AND WAIVERS

An operator submitting a plan of operations to the BLM may request an exception, modification, or waiver of a stipulation included in a lease.

- Exception: Case-by-case exemption from a lease stipulation. The stipulation continues to apply to all other sites within the leasehold to which the restrictive criteria apply.
- Modification: Fundamental change to the provisions of a lease stipulation, either temporarily or for the term of the lease. A modification may, therefore, include an exemption from or alteration to a stipulated requirement. Depending on the specific modification, the stipulation may or may not apply to all other sites within the leasehold to which the restrictive criteria applied.
- Waiver: Permanent exemption from a lease stipulation. The stipulation no longer applies anywhere within the leasehold.

*According to 43 CFR 3101.1-4, "A stipulation included in an oil and gas lease shall be subject to modification or waiver only if the authorized officer determines that the factors leading to its inclusion on the lease have change sufficiently to make the protection provided by the stipulation no longer justified or if the proposed operations would not cause unacceptable impacts." Exceptions, modifications, and waivers must be supported by appropriate environmental analysis and documentation. If the authorized officer has determined, prior to lease issuance, that a stipulation involves an issue of major concern to the public, modification or waiver of the stipulation shall be subject to public review for at least a 30-day period. In such cases, the stipulation shall indicate that public review is required before modification or waiver. If subsequent to lease issuance the authorized officer determines that a modification or waiver of a lease term or stipulation is substantial, the modification or waiver shall be subject to public review for at least a 30-day period.*

Table B-1 includes the criteria for considering request for exceptions, modifications, and waivers according to stipulations applied for the alternatives.



Table B-1

<b>Management #</b>	1107			
<b>Protected Resource</b>	Soils with low reclamation potential.			
<b>RMP Affected Area</b>	Areas with low reclamation potential (as per Natural Resources Conservation Service [NRCS] soil rating map).			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	CSU	NSO	None	CSU
<b>Action Text</b>	<p>Areas where the soils are highly erodible or difficult to reclaim would receive increased attention, and are avoidance areas for surface disturbing activities. Surface disturbing activities could be allowed in these areas if site specific analysis determines that soil degradation would not occur and that water quality would not be adversely affected. When applicable, an erosion control plan (such as an ERRP, Appendix 5-3) would be prepared as part of the site specific analysis process for activity and implementation planning. Rehabilitation plans would be developed and implemented for disturbed areas, as needed.</p>	<p>Prohibit surface disturbing activities in areas where the soils have any of the following:</p> <ol style="list-style-type: none"> <li>1) a wind erodibility index greater than 100</li> <li>2) saline</li> <li>3) sodic</li> <li>4) saline-sodic</li> <li>5) 2:1 clays</li> <li>6) sand dunes</li> <li>7) slopes greater than 25%</li> <li>8) slumps and creeps and/or rutting</li> <li>9) areas that are difficult to reclaim.</li> </ol> <p>Manage as: (1) NSO for fluid minerals, (2) closed to mineral material sales/disposals, (3) closed to all solid mineral leasing.</p>	No similar action	<p>Avoid surface disturbing activities in areas with limited reclamation potential (as per NRCS soil rating), subject to adequate mitigation of impacts following BLM mitigation policies. The operator must submit an approved mitigation plan before proposed project will be approved.</p> <p>CSU for fluid minerals.</p>
<b>Stipulation Description</b>	<b>Stipulation:</b> Surface occupancy or use is restricted	<b>Stipulation:</b> No surface disturbance activities will be	None	Same as A

	<p>on limited reclamation potential areas such as areas possessing sensitive geologic formations, limited reclamation potential soils, biological crusts, soils with low reclamation potential, and soils with highly erosive characteristics.</p> <p>(1) Prior to surface disturbance on limited reclamation potential areas, a site-specific construction, stabilization, and reclamation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The Plan must include designs approved and stamped by a licensed engineer. The operator shall not initiate surface-disturbing activities unless the BLM AO has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the BLM AO's satisfaction how the operator will meet the following performance standards:</p> <ul style="list-style-type: none"> <li>• The disturbed area will be stabilized with no evidence of accelerated erosion features.</li> <li>• The disturbed area shall be managed to ensure soil characteristics approximate</li> </ul>	<p>allowed in areas where the soils have any or the following: a wind erodibility index greater than 100, saline, sodic, saline-sodic, 2:1 clays, sand dunes, slopes greater than 25%, slumps and creeps and/or rutting, and areas that are difficult to reclaim.</p> <p>(1) Prior to surface disturbance on limited reclamation potential areas, a site-specific construction, stabilization, and reclamation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The Plan must include designs approved and stamped by a licensed engineer. The operator shall not initiate surface-disturbing activities unless the BLM AO has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the BLM AO's satisfaction how the operator will meet the following performance standards:</p> <ul style="list-style-type: none"> <li>• The disturbed area will be stabilized with no evidence of accelerated erosion features.</li> <li>• The disturbed area shall be managed to ensure soil characteristics approximate</li> </ul>		
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	<p>an appropriate reference site with regard to erosional features to maintain soil productivity and sustainability.</p> <ul style="list-style-type: none"> <li>• Slope stability is maintained preventing slope failure and erosion.</li> <li>• Sufficient viable topsoil is maintained for ensuring successful final reclamation. At locations where interim reclamation will be completed, this will be accomplished by respreading all salvaged topsoil over the areas of interim reclamation.</li> <li>• The original landform and site productivity will be partially restored during interim reclamation and fully restored as a result of final reclamation.</li> </ul> <p>(2) As mapped by the NRCS SSURGO Order 3 soil survey or as determined by BLM evaluation of the area. For the purpose of (3) ensuring successful reclamation and erosion control on limited reclamation potential areas in order to meet the standards outlined in, Chapter 6 of the BLM’s Oil and Gas Gold Book, and Wyoming Reclamation Policy.</p>	<p>an appropriate reference site with regard to erosional features to maintain soil productivity and sustainability.</p> <ul style="list-style-type: none"> <li>• Slope stability is maintained preventing slope failure and erosion.</li> <li>• Sufficient viable topsoil is maintained for ensuring successful final reclamation. At locations where interim reclamation will be completed, this will be accomplished by respreading all salvaged topsoil over the areas of interim reclamation.</li> <li>• The original landform and site productivity will be partially restored during interim reclamation and fully restored as a result of final reclamation.</li> </ul> <p>(2) As mapped by the NRCS SSURGO Order 3 soil survey or as determined by BLM evaluation of the area. For the purpose of (3) ensuring successful reclamation and erosion control on limited reclamation potential areas in order to meet the standards outlined in, Chapter 6 of the BLM’s Oil and Gas Gold Book, and Wyoming Reclamation Policy.</p>		
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	<p><b>Purpose:</b> To protect soils with low reclamation potential.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a NRCS soil survey and BLM evaluation. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> This stipulation may be waived over the entire leasehold if the BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon NRCS mapping and BLM evaluation.</p>	<p><b>Purpose:</b> To protect soils with low reclamation potential.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>		
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<b>Management #</b>	1116			
<b>Protected Resource</b>	Scientific and scenic values of Pilot Butte and Emmons Cone.			
<b>RMP Affected Area</b>	Pilot Butte (121 acres), and Emmons Cone (60 acres).			
<b>Alternative</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>



Stipulation	NSO	NSO	NSO	NSO
<b>Action Text</b>	The natural values of Boars Tusk, Pilot Butte, and Emmons Cone would be protected. Surface occupancy and surface disturbing activities are prohibited in these areas, unless such activity would enhance management of these geologic features. Interpretive facilities would be allowed.	Same as Alternative A	The natural values of Boars Tusk, Pilot Butte, and Emmons Cone would be protected. Surface occupancy and surface disturbing activities are prohibited in these areas unless such activity would enhance management of these geologic features. NSO for fluid minerals. Interpretive facilities would be allowed.	Protect the scientific and scenic values of Pilot Butte, and Emmons Cone. Prohibit surface occupancy and surfacedisturbing activities in these areas, unless such activity would enhance management of these geologic features (NSO for fluid minerals). Interpretive facilities would be allowed
<b>Stipulation Description</b>	<p><b>Stipulation:</b> No surface occupancy or use will be allowed in the areas surrounding Pilot Butte and Emmons Cone as shown on Map 2-5.</p> <p><b>Purpose:</b> To protect the scientific and scenic values of Pilot Butte and Emmons Cone.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards</p>	<p><b>Stipulation:</b> No surface occupancy or use will be allowed in the areas surrounding Pilot Butte and Emmons Cone as shown on Map 2-6.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>	<p><b>Stipulation:</b> Same as A</p>	<p><b>Stipulation:</b> Restrict surface disturbing activities unless a plan is first approved by the AO that demonstrates the proposed action will not affect the resource or will enhance management of the features.</p> <p><b>Purpose:</b> To protect the scientific and scenic values of Pilot Butte and Emmons Cone.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and</p>

	<p>identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>			<p>performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>
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<b>Management #</b>	1313			
<b>Protected Resource</b>	100 year floodplain, wetlands, riparian areas, perennial streams, and 500 feet of the edge of the inner gorge of large ephemeral drainages.			
<b>RMP Affected Area</b>	See Map 2-6			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	None	NSO	None	CSU
<b>Action Text</b>	<p>The 100-year floodplains, wetlands, and riparian areas are closed to any new permanent facilities (e.g., storage tanks, structure pits, etc.).</p> <p>Proposals for linear crossings in these areas would be</p>	<p>Prohibit surface disturbing activities and new permanent facilities (e.g., storage tanks, structure pits, etc.) within 1,320 feet (¼ mile) of 100- year floodplains, wetlands, riparian areas, perennial streams, and 500 feet of the</p>	<p>Consider, on a case-by-case basis, surface disturbing activities and new permanent facilities (e.g., storage tanks, structure pits, etc.) proposed for placement within riparian areas or wetlands and 100- year floodplains or adjacent to</p>	<p>Avoid placement of permanent facilities within 100-year floodplains, and within 1,320 feet (¼ mile) of wetlands, riparian areas, and perennial streams.</p> <p>Avoid surface disturbing and construction activities within 500 feet of the outer edge of</p>

	<p>considered on a case-by-case basis.</p>	<p>edge of the inner gorge of large ephemeral drainages.</p> <p>Manage as: (1) NSO for fluid minerals, (2) closed to mineral material sales/disposal, (3) closed to all solid mineral leasing.</p> <p>Avoid linear crossings in these areas.</p>	<p>the inner gorge of large ephemeral drainages.</p> <p>Consider, on a case-by-case basis, linear crossings in these areas.</p>	<p>wetland/riparian areas or perennial streams.</p> <p>Avoid surface disturbing and construction activities within 100 feet of the edge of the inner gorge of intermittent channels or ephemeral drainages.</p> <p>Designate these areas as a rights-of-way (ROW) avoidance area.</p> <p>Allow linear crossings if a site specific analysis by a BLM AO determines that no adverse impacts would be likely to occur and a plan to mitigate potential impacts to water quality is approved.</p> <p>Allow structures that would enhance the protection and management of streams, wetlands, and riparian areas.</p> <p>Approval will be on a case-by-case basis and subject to adequate mitigation of impacts following BLM mitigation policies and Wyoming BLM Mitigation Guidelines for Surface-Disturbing and Disruptive Activities.</p>
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> No surface disturbing activities would be allowed within 1,320 feet (1/4 mile) of 100-year floodplains, wetlands, riparian areas, perennial streams, and within</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Restrict surface-disturbing activities within 1,320 feet (1/4 mile) of 100- year floodplains, wetlands, riparian areas, perennial streams, and within 500 feet</p>

		<p>500 feet from of the edge of the inner gorge of large ephemeral drainages.</p> <p><b>Purpose:</b> To protect 100-year floodplains, wetlands, riparian areas, perennial streams, and 500 feet of the edge of the inner gorge of large ephemeral drainages.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>		<p>from of the edge of the inner gorge of large ephemeral drainages. Unless a plan is first approved by the AO that demonstrates the proposed action will not affect the resource.</p> <p><b>Purpose:</b> To protect 100-year floodplains, wetlands, riparian areas, perennial streams, and 500 feet of the edge of the inner gorge of large ephemeral drainages.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include 100-year floodplains, wetlands, riparian areas perennial streams, or large</p>
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				ephemeral drainages. This determination shall be based upon BLM evaluation or environmental record of review.
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<b>Management #</b>	1317			
<b>Protected Resource</b>	Aquifer recharge areas.			
<b>RMP Affected Area</b>	Map 2-5			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	CSU	CSU	None	CSU
<b>Action Text</b>	<p>Aquifer recharge areas would be managed to protect groundwater quality and to ensure continued ability for recharging aquifers. Protection would be provided by limiting road density and surface occupancy to maintain a healthy recharge area. Vegetative cover and geologic soil condition that are conducive to groundwater recharge would be maintained.</p>	<p>Manage aquifer recharge areas to protect groundwater quality and quantity to ensure continued ability for recharging aquifers.</p> <p>Manage aquifer recharge areas to maintain or enhance recharge volume and ground water quality by limiting road density, chemical use and storage, and surface occupancy (managed as CSU for fluid minerals) to maintain a healthy recharge area.</p> <p>Conduct studies in relation to specific projects to better define aquifer recharge area boundaries.</p>	<p>Aquifer recharge areas would be managed to protect groundwater quality and to ensure continued ability for recharging aquifers.</p>	<p>Manage activities in aquifer recharge areas to protect groundwater quality and quantity to ensure continued function.</p> <p>Manage activities in aquifer recharge areas to maintain, at a minimum, recharge volume and ground water quality by limiting road density, chemical use and storage, and surface occupancy to maintain a healthy recharge area.</p> <p>CSU for fluid minerals.</p> <p>Apply the above actions to newly identified and mapped recharge areas.</p>

<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> Restrict surface disturbing activities on lands identified as the aquifer recharge areas unless a plan is first approved by the AO that demonstrates the proposed action will not affect the resource.</p> <p><b>Purpose:</b> To protect the aquifer recharge areas.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not impair the function or utility of the site.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include aquifer recharge areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>	<p><b>Stipulation:</b> Same as A</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None <b>Waiver:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Same as A</p>
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<b>Management #</b>	1319			
<b>Protected Resource</b>	Water recharge area for the towns of Superior and McKinnon.			
<b>RMP Affected Area</b>	Map 2-6			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	CSU	NSO	CSU	Closed
<b>Action Text</b>	<p>Activities within the water recharge area for the Town of Superior water supply would be designed to protect groundwater quality and would be allowed only if groundwater quality would be protected.</p> <p>Identified as CSU for fluid minerals in Table 2.4 (Appendix V) and closed to coal exploration and sodium prospecting.</p>	<p>Design activities within the water recharge area for the Town of Superior water supply to protect groundwater quality.</p> <p>Manage as NSO for fluid minerals.</p>	Same as Alternative A	<p>Avoid surface disturbing activities and subsurface mineral activity in the identified or designated water recharge area for the towns of Superior and McKinnon.</p> <p>Unavailable to fluid minerals leasing</p> <p>Designate as a ROW avoidance area</p>
<b>Stipulation Description</b>	<p><b>Stipulation:</b> Restrict surface disturbing activities on lands identified as the water recharge area for the towns of Superior and McKinnon unless a plan is first approved by the AO the demonstrates the proposed action will not affect the water supplies of the towns.</p> <p><b>Purpose:</b> To protect the water supplies for the town of Superior.</p>	<p><b>Stipulation:</b> No surface occupancy or use is allowed for lands identified as the water recharge area for the town of Superior.</p> <p><b>Purpose:</b> To protect the water supplies for the town of Superior.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>	<b>Stipulation:</b> Same as A	

	<p><b>Exception:</b> An exception to this restriction or stipulation may be granted by the AO, if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.</p> <p><b>Modification:</b> The stipulated area may be modified by the AO if the lands identified as water recharge area change.</p> <p><b>Waiver:</b> This stipulation maybe waived, if the AO determines that the entire leasehold no longer contains lands with the water recharge area.</p>			
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<b>Management #</b>	1325			
<b>Protected Resource</b>	Area of shallow unconfined aquifers.			
<b>RMP Affected Area</b>	Map 2-6			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	None	NSO	None	None
<b>Action Text</b>	No similar action	<p>Prohibit surface occupancy and surface disturbing activities in areas of shallow unconfined aquifers.</p> <p>Manage as: (1) NSO for fluid minerals, (2) closed to mineral</p>	Consider closed loop drilling systems in areas of shallow unconfined aquifers.	No similar action (see management action 1320).



		material sales/disposal, (3) closed to all solid mineral leasing.		
<b>Stipulation Description</b>	<b>Stipulation:</b> None	<p><b>Stipulation:</b> No surface occupancy or surface disturbing activities are allowed in area of shallow unconfined aquifers.</p> <p><b>Purpose:</b> To protect water in areas of shallow unconfined aquifers.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>	<b>Stipulation:</b> None	<b>Stipulation:</b> None

<b>Management #</b>	2202			
<b>Protected Resource</b>	Mechanically Mineable Trona Area (MMTA)			
<b>RMP Affected Area</b>	MMTA 144,409 acres			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	None	Closed	CSU	Closed
<b>Action Text</b>	No similar action	<p>Continue to suspend existing oil and gas leases from development within the Mechanically Mineable Trona Area (MMTA).</p> <p>Close the MMTA (MMTA federal 141,409 acres) for new fluid mineral leasing until the</p>	The MMTA would be managed as a CSU. Recovery of the oil and gas resource must be accomplished without compromising the safety of underground miners.	Existing oil and gas leases are suspended in the MMTA (141,409 surface acres). The MMTA is administratively unavailable for new fluid mineral leasing until the oil and gas resource can be recovered without

		oil and gas resource can be recovered without compromising the safety of the underground miners.		compromising the safety of underground miners.
<b>Stipulation Description</b>	<b>Stipulation: None</b>	<b>Stipulation: None</b>	<p><b>Stipulation:</b> No drilling would be allowed in MMTA unless a drill plan is submitted to the Authorized Officer that insures the safety of the underground miners. The drill plan must be signed by a professional registered engineer.</p> <p><b>Purpose:</b> To protect the safety of underground miners.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>	<b>Stipulation: None</b>

<b>Management #</b>	2215			
<b>Protected Resource</b>	JMH Area 2.			
<b>RMP Affected Area</b>	Map 2-8			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	CSU	CSU	None	CSU
<b>Action Text</b>	Area 2 is open to leasing considering such factors as operational need, resource recovery, geology, and ability to mitigate impacts and with stipulations applied to protect	Area 2 of the JMH planning area would be open to fluid mineral leasing considering such factors as operational need, resource recovery, geology, mineral potential, and	Area 2 of the JMH planning area would be open to fluid mineral leasing.	Area 2 is open to leasing considering such factors as operational need, resource recovery, geology, and ability to mitigate impacts and with stipulations applied to protect

	<p>sensitive resources in Area 2 (Table 2-4, Appendix V). The BLM may request potential lessees to share data (such as reservoir data or geologic data) or plans related to the development of the potential oil and gas resource prior to leasing; sharing of these data is voluntary.</p>	<p>ability to mitigate impacts with appropriate stipulations (Table 2-4, Appendix V).</p>		<p>sensitive resources in Area 2 (Table 2-4, Appendix V). CSU for fluid minerals. The BLM may request potential lessees to share data (such as reservoir data or geologic data) or plans related to the development of the potential oil and gas resource prior to leasing; sharing of these data is voluntary.</p>
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> Before surface disturbing activities are conducted the operator provide the Authorized Officer a plan to protect sensitive resources within the area. <b>Purpose:</b> To protect the sensitive resources in Area 2. <b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above. <b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to</p>	<p><b>Stipulation:</b> Same as A. <b>Exception:</b> None <b>Modification:</b> None <b>Waiver:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Same as A.</p>

	<p>national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area in not with-in Area 2. This determination shall be based upon BLM evaluation or environmental record of review.</p>			
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<b>Management #</b>	2217			
<b>Protected Resource</b>	Jack Morrow Hills (JMH) Area 3.			
<b>RMP Affected Area</b>	35,500 acres			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	NSO	None	None	CSU
<b>Action Text</b>	<p>Approximately 35,500 acres along the perimeter of Area 3 are available for leasing with an NSO stipulation. This acreage represents a distance of ½ mile within portions of the boundary of Area 3. Although current technologies suggest that the ½-mile distance is adequate at this time, these NSO areas may be expanded to include additional adjacent acreage provided the planning area resource objectives can be met.</p>	<p>Close approximately 35,500 acres along the perimeter of JMH Area 3 to fluid mineral leasing. This acreage represents a distance of ½ mile within portions of the boundary of Area 3.</p>	<p>No similar action.</p>	<p>Approximately 35,500 acres along the perimeter of JMH Area 3 would be available for leasing with a CSU stipulation. This acreage represents a distance of ½ mile within portions of the boundary of Area 3. This area will be managed with the same stipulations as the remainder of Area 3 for a total of 127,500 acres.</p>

<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> No surface occupancy is allowed within ½ mile perimeter of Area 3 in JMH.</p> <p><b>Purpose:</b> To protect the resource values of Area 3 in the JMH.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Restrict surface occupancy or use within ½ mile perimeter of Area 3 in JMH.</p> <p><b>Purpose:</b> To protect the resource values of Area 3 in the JMH.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> None</p>
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<p><b>Management #</b></p>	<p>2218</p>
<p><b>Protected Resource</b></p>	<p>JHM Area 3.</p>
<p><b>RMP Affected Area</b></p>	<p>Alternative A and B 92,000 acres, Alternative D 127,000 acres.</p>

Alternative	A	B	C	D
<b>Stipulation</b>	Closed	Closed	None	CSU
<b>Action Text</b>	<p>The remainder of JMH Area 3 is closed to oil and gas leasing (about 92,000 acres). This closure is established to meet the resource goals and objectives for the planning area. These objectives include providing adequate habitat as well as opportunity for the use of crucial winter range, calving/fawning areas, migration corridors, etc. and protection of sensitive resources and public health and safety (Table 2-4, Appendix V). Area 3 includes portions of the Steamboat Mountain ACEC, Greater Sand Dunes ACEC, White Mountain Petroglyphs ACEC, Oregon Buttes ACEC, South Pass Historic Landscape ACEC, the White Mountain and Split Rock areas, and the core and connectivity areas.</p>	<p>Close JMH Area 3 to fluid mineral leasing (about 92,000 acres).</p> <p>As existing leases expire in Area 3, they would not be reoffered for lease (Table 2-4, Appendix V), including the perimeter of Area 3 identified above.</p>	No similar action	<p>JMH Area 3 would be managed as a CSU for oil and gas leasing (about 127,500 acres). The CSU is established to meet the resource goals and objectives for the area. These objectives include providing adequate habitat as well as opportunity for the use of crucial winter range, calving/fawning areas, migration corridors, etc. and protection of sensitive resources and public health and safety (Table 2-4, Appendix V).</p>
<b>Stipulation Description</b>	<b>Stipulation:</b> None	<b>Stipulation:</b> None	<b>Stipulation:</b> None	<p><b>Stipulation:</b> Before surface disturbing activities are conducted the operator provide the AO a plan to protect sensitive resources within the area.</p> <p><b>Purpose:</b> To insure that the resource goals and objectives of the area, such as providing</p>

				<p>adequate habitat as well as opportunity for the use of crucial winter range, calving/fawning areas, migration corridors, etc. and protection of sensitive resources and public health and safety are met.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area is not within Area 3. This determination shall be based upon BLM evaluation or environmental record of review.</p>
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<b>Management #</b>	4421			
<b>Protected Resource</b>	Big game crucial winter range and parturition areas.			
<b>RMP Affected Area</b>	Map-2-6			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	TLS	NSO	TLS	TLS
<b>Action Text</b>	<p>In the Jack Morrow Hills planning area, disruptive activities would be prohibited in big game crucial winter range between November 15 and April 30. Seasonal limitations may be excepted, provided criteria in Appendix B can be met and appropriate mitigation can be implemented (as determined by BLM). Mitigation of adverse effects (e.g., noise and traffic) on all habitats would be determined and applied on a case-by-case basis.</p>	<p>Prohibit surface disturbing or disruptive activities in big game crucial winter ranges, parturition areas, migration corridors, and transitional habitats, as identified by the Wyoming Game and Fish Department (WGFD).</p> <p>Manage as: (1) NSO for fluid minerals, (2) closed to mineral material sales/disposal, (3) closed to all solid mineral leasing.</p>	<p>Restrict surface disturbing and/or disruptive activities in big game crucial winter range between November 15 and April 30.</p> <p>Restrict surface disturbing and/or disruptive activities in big game birthing areas between May 1 and June 30.</p> <p>Grant exceptions if impacts could be mitigated in accordance with exception criteria (see specific exception/waiver/modification criteria, Appendix B).</p> <p>Determine and apply mitigation of adverse effects (e.g., noise and traffic) on all habitats.</p>	<p>Allow surface disturbing activities on big game crucial winter ranges and parturition areas (see Map 3-3) subject to adequate mitigation of impacts following BLM mitigation policies. Avoid disruptive activities in big game crucial winter range between November 15 and April 30.</p> <p>Avoid disruptive activities in big game parturition areas between May 1 and June 30.</p> <p>Grant exceptions if impacts could be mitigated in accordance with exception criteria (see specific exception/waiver/modification criteria, Appendix B).</p> <p>Determine and apply mitigation of impacts (e.g., noise and traffic) on all habitats and habitat functionality.</p>
<b>Stipulation Description</b>	<b>Stipulation:</b> No disruptive activities will be allowed in big	<b>Stipulation:</b> No surface occupancy or use on big game	<b>Stipulation:</b> Same as A	<b>Stipulation:</b> No disruptive activities will be allowed in big



	<p>game crucial winter range between November 15 and April 30, or in big game parturition areas between May 1 and June 30.</p> <p><b>Purpose:</b> To protect big game winter range and parturition areas from activities that would adversely harm them during winter months and in breeding season.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>	<p>crucial winter range or big game parturition areas.</p> <p><b>Purpose:</b> To protect big game winter range and parturition areas from activities that would adversely harm them during winter months and in breeding season.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None <b>Waiver:</b> None</p>		<p>game crucial winter range between November 15 and April 30.</p> <p><b>Stipulation:</b> No disruptive activities will be allowed in big game parturition areas between May 1 and June 30.</p> <p><b>Purpose:</b> To protect big game winter range and parturition areas from activities that would adversely harm them during winter months and in breeding season.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM</p>
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				evaluation or environmental record of review.
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<b>Management #</b>	4424			
<b>Protected Resource</b>	Big game migration corridors.			
<b>RMP Affected Area</b>	Map 2-6			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	None	NSO	None	CSU
<b>Action Text</b>	No similar action	Identify and preserve wildlife species migration and travel corridors. Prohibit surface disturbing activities within ½ mile of big game migration corridors (to avoid constriction of current or future identified big game corridors.  Manage as: (1) NSO for fluid minerals; (2) closed to mineral material sales/disposal; (3) closed to all solid mineral leasing.	Restrict, on a case by case basis, surface disturbing activities within identified wildlife migration corridors.	Allow fluid mineral surface occupancy and use within WGFD designated big game migration corridors if the fluid mineral operator and the BLM arrive at an acceptable conservation plan for avoidance, minimization, rectification, and/or restoration within the migration corridor. The purpose of the conservation plan is to ensure that fluid mineral development activities are pursued in a manner that maintain habitat function and result in no significant declines in species distribution or abundance. The BLM will consult with the WGFD to evaluate the adequacy of the conservation plan prior to finalization.  CSU for fluid minerals.

<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> No surface occupancy within ½ mile of big game migration corridors.</p> <p><b>Purpose:</b> To protect big game migration corridors.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None <b>Waiver:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Restrict surface disturbing activities unless the operator and BLM arrive at an acceptable migration corridor conservation plan for avoidance, minimization, rectification, and/or restorationis required prior to the approval for surface occupancy or use within a designated big game migration corridor. The purpose of the conservation plan is to ensure that development activities are completed in a manner that is compatible with maintaining designated big game migration corridor functionality(i.e., unimpeded big game movement and use within the corridor).</p> <p><b>Purpose:</b> To protect big game migration corridors toensure that development activities don't affect their functionality.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>
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<b>Management #</b>	4430			
<b>Protected Resource</b>	Raptor nests.			
<b>RMP Affected Area</b>	One-mile radius of raptor nests per BLM Map 2-6 Alternatives B and D, ½-mile radius of raptor nests per BLM Map 2-7 Alternatives A and C.			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	CSU	NSO	CSU	CSU
<b>Action Text</b>	<p>Project components, such as permanent and high-profile structures, e.g., buildings, storage tanks, powerlines, roads, well pads, etc., are prohibited within an appropriate distance of active raptor nests. The appropriate distance (usually less than ½ mile) would be determined on a case-by-case basis and may vary depending upon the species involved, natural topographic barriers, and line-of-sight distances, etc.</p> <p>Placement of facilities, "on" (very low profile) or below ground, and temporary disruptive activities, such as occur with pipeline construction, seismic activity, etc., could be granted exceptions within ½ mile of active raptor nests, in certain circumstances (Appendix J).</p>	<p>Prohibit surface occupancy within one mile of active and historic raptor nests and associated feeding grounds. This includes project components such as permanent and/or high profile structures (e.g., buildings, storage tanks, powerlines, roads, well pads, etc.).</p> <p>Manage as: (1) NSO for fluid minerals, (2) closed for coal and sodium prospecting, (3) closed to material sales, (4) avoidance area for new ROW.</p> <p>Buffer recommendations could be modified on a site-specific or project-specific basis based on field observations and local conditions.</p> <p>Infrastructure (or facilities) that have potential to cause direct avian mortality (e.g., wind turbines, guyed towers, airports, wastewater disposal facilities, or transmission lines)</p>	<p>Project components, such as permanent and high-profile structures (e.g., buildings, storage tanks, powerlines, roads, well pads, etc.) are restricted within an appropriate distance of active raptor nests. The appropriate distance (usually less than ½ mile) would be determined on a case-by-case basis and may vary depending upon the species involved, natural topographic barriers, and line-of-sight distances, etc.</p> <p>CSU for fluid minerals.</p>	<p>Allow surface occupancy within the identified buffer of occupied and historic raptor nests, subject to adequate mitigation of impacts following BLM mitigation policies. This includes project components such as permanent and/or high-profile structures (e.g., buildings, storage tanks, powerlines, roads, well pads, etc.):</p> <ul style="list-style-type: none"> <li>• Ferruginous hawk – ½ miles</li> <li>• Bald eagle – 1 mile</li> <li>• Golden eagle – ¼ miles</li> <li>• Burrowing owl – ¼ miles</li> <li>• General raptor – ¼ miles.</li> </ul> <p>CSU for fluid minerals.</p> <p>Modify buffer recommendations, on a site-specific or project-specific basis, based on field observations and local conditions.</p>

		<p>would follow USFWS recommendations to locate structures away from high avian-use areas such as those used for nesting, foraging, roosting, or migrating, and the travel between high-use areas.</p>		<p>Require implementation of USFWS recommendations to locate structures away from high avian-use areas such as those used for nesting, foraging, roosting or migrating, and the travel between high-use areas on infrastructure (or facilities) that have potential to cause direct avian mortality (e.g., wind turbines, guyed towers, airports, wastewater disposal facilities, or transmission lines).</p>
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> Restrict surface occupancy or use unless the operator submits a plan that adequately address mitigation of impacts following the BLM mitigation policy to raptors nests within ½-mile radius.</p> <p><b>Purpose:</b> To protect raptor nests from structures that have a potential to cause direct avian mortality.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above. The determination may include consultation with the WGFD or USFWS.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a</p>	<p><b>Stipulation:</b> No surface occupancy or use within one mile of raptor nests.</p> <p><b>Purpose:</b> To protect raptor nests from structures that have a potential to cause direct avian mortality.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>	<p><b>Stipulation:</b> Same as A</p>	<p><b>Stipulation:</b> Restrict surface occupancy or use unless the operator submits a plan that adequately addresses mitigation of impacts following the BLM mitigation policy for raptor nests within a one-mile radius.</p> <p><b>Purpose:</b> To protect nesting raptors during critical breeding periods.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above. The determination may include consultation with the WGFD or USFWS.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a</p>

	<p>BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards. The determination may include consultation with the WGFD or USFWS.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review. The determination may include consultation with the WGFD or USFWS.</p>			<p>BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards. The determination may include consultation with the WGFD or USFWS.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review. The determination may include consultation with the WGFD or USFWS.</p>
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<b>Management #</b>	4431			
<b>Protected Resource</b>	Raptor nests.			
<b>RMP Affected Area</b>	Raptor nests. Alternative A ½- to one-mile radius, Alternative B two-mile radius, Alternative C ½-mile radius and Alternative D one-mile radius.			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	TLS	TLS	TLS	TLS

<p><b>Action Text</b></p>	<p>Nesting raptors would be protected by restricting disruptive activities seasonally within ½- to one-mile radius of occupied raptor nesting sites.</p>	<p>Restrict surface disturbing and disruptive activities seasonally within a two-mile radius of active and historic raptor nesting sites and associated feeding grounds to protect nesting raptors.</p>	<p>Restrict surface disturbing or disruptive activities seasonally within a ½-mile radius of occupied raptor nesting sites to protect nesting raptors.</p>	<p>Avoid surface disturbing and disruptive activities seasonally within the identified buffer of occupied and historic raptor nest sites (see Appendix J).</p>
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> No surface occupancy or disturbing activities within ½-mile to one-mile radius during raptor seasonal restrictions (generally February 1 to August 15) unless the operator submits a plan that adequately addresses mitigation of impacts following the BLM mitigation policy to raptor nests.</p> <p><b>Purpose:</b> To avoid a take under the Migratory Bird Treaty Act (MBTA) and protect raptor nest from structures that have a potential to cause direct avian mortality.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the nest(s) are not active or the proposed action is of a scale, sited in a location, or otherwise designed so that the proposed action would not disturb (be likely to cause: physical injury; a decrease in productivity by substantially interfering with normal</p>	<p><b>Stipulation:</b> No surface occupancy or disturbing activities within a two-mile radius during raptor seasonal restrictions (generally February 1 to August 15) unless the operator submits a plan that adequately addresses mitigation of impacts following the BLM mitigation policy to raptor nests.</p> <p><b>Purpose:</b> To avoid a take under the MBTA and protect raptor nest from structures that have a potential to cause direct avian mortality.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>	<p><b>Stipulation:</b> No surface occupancy or disturbing activities within ½-mile radius during raptor seasonal restrictions (generally February 1 to August 15) unless the operator submits a plan that adequately addresses mitigation of impacts following the BLM mitigation policy to raptor nests.</p> <p><b>Purpose:</b> To avoid a take under the MBTA and protect raptor nest from structures that have a potential to cause direct avian mortality.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the nest(s) are not active or the proposed action is of a scale, sited in a location, or otherwise designed so that the proposed action would not disturb (be likely to cause: physical injury; a decrease in productivity by substantially interfering with normal breeding, feeding, or</p>	<p><b>Stipulation:</b> No surface occupancy or disturbing activities within one-mile radius during raptor seasonal restrictions (generally February 1 to August 15) unless the operator submits a plan that adequately addresses mitigation of impacts following the BLM mitigation policy to raptor nests.</p> <p><b>Purpose:</b> To protect nesting raptors during critical breeding period.</p> <p><b>Exception:</b> The AO may grant an exception if the operator demonstrates that there are no active nests during the period of concern, subject to confirmation by the BLM in coordination with WGFD and/or USFWS, as necessary.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulations based upon a BLM evaluation in coordination with WGFD and/or USFWS, as necessary.</p>

	<p>breeding, feeding, or sheltering behavior; or nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior) nesting of the species of conservation concern. The determination may include consultation with the WGFD or USFWS.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulations based upon a BLM evaluation in coordination with WGFD and/or USFWS, as necessary. The stipulation may be modified based on negative or positive monitoring results; or if it is determined that the action will not impair the function or the suitability of the habitat, or cause nest abandonment.</p> <p><b>Waiver:</b> The stipulation may be waived if the BLM AO determines that the entire lease area does not include seasonal buffer zones for nests of raptor species of conservation concern. This determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM, in coordination with the WGFD and/or USFWS, as necessary.</p>		<p>sheltering behavior; or nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior) nesting of the species of conservation concern. The determination may include consultation with the WGFD or USFWS.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulations based upon a BLM evaluation in coordination with WGFD and/or USFWS, as necessary. The stipulation may be modified based on negative or positive monitoring results; or if it is determined that the action will not impair the function or the suitability of the habitat, or cause nest abandonment.</p> <p><b>Waiver:</b> The stipulation may be waived if the BLM AO determines that the entire lease area does not include seasonal buffer zones for nests of raptor species of conservation concern. This determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM, in coordination with the WGFD and/or USFWS, as necessary.</p>	<p>The stipulation may be modified based on monitoring results; or if it is determined that the action will not impair the function or the suitability of the habitat, or cause nest abandonment.</p> <p><b>Waiver:</b> The stipulation may be waived if the BLM AO determines that the entire lease area does not include seasonal buffer zones for nests of raptor species of conservation concern. This determination shall be based upon field studies of the area by a qualified representative and subject to confirmation from BLM, in coordination with the WGFD and/or USFWS, as necessary.</p>
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<b>Management #</b>	4435			
<b>Protected Resource</b>	Game fish and Special Status fish populations during spawning season.			
<b>RMP Affected Area</b>	Fish-bearing streams.			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	TLS	TLS	None	TLS
<b>Action Text</b>	<p>Seasonal restrictions for surface disturbing activities to protect game fish and Special Status fish populations during spawning would be applied as necessary.</p>	<p>Apply TLS to surface disturbing activities within ¼ mile of riparian areas along fish-bearing streams to protect spawning, egg incubation, and fry areas in fish-bearing streams. Apply spring TLS from March 15 to July 31 and fall TLS from September 15 to November 30. Critical dates often vary based on site location and species composition.</p> <p>Manage as: (1) TLS for fluid minerals, (2) closed to all solid mineral leasing.</p> <p>Evaluate, on a case-by-case basis, requests for exceptions to timing limitations and consider reducing or increasing these standard dates (see Appendix B for specific exception/waiver/modification criteria). Consult</p>	<p>No TLS would be applied to surface disturbing activities to protect fisheries critical life stages.</p>	<p>Avoid surface disturbing and construction activities (e.g., mineral exploration and development activities, pipelines, power-lines, roads, recreation sites, fences, wells, etc.) within the 100-year floodplains that could adversely affect fish-bearing streams.</p> <p>Allow linear crossings in these areas on a case-by-case basis only if the BLM determines that no adverse impacts would likely occur and a plan to mitigate potential impacts to water quality and fish habitat is approved.</p> <p>Avoid surface disturbing activities within fish-bearing streams to protect spawning habitat, egg incubation, and fry from March 15 to July 31 and fall TLS from September 15 to November 30. Critical</p>

		<p>with the WGFD on evaluations of all such requests.</p>		<p>dates often vary based on site location and species composition.</p> <p>Evaluate requests for exceptions to timing limitations and consider reducing or increasing these standard dates (see Appendix B for specific exception/waiver/modification criteria). Consult with the WGFD on evaluations of requests.</p>
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> No surface disturbing activities within fish-bearing stream from March 15 to July 31 and from September 15 to November 30.</p> <p><b>Purpose:</b> To protect spawning activities and egg incubation of fish during reproductive periods.</p> <p><b>Exception:</b> The AO may grant an exception if the operator demonstrates that spawning habitat is not occupied during the period of concern, subject to confirmation by the BLM in coordination with WGFD as appropriate; or if it is determined that the action will not impair the function or the suitability of the habitat.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulations based upon a</p>	<p><b>Stipulation:</b> Same as A</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None <b>Waiver:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Same as A</p>

	<p>determination by the BLM in coordination with WGFD, as appropriate, that the lease area does not contain fish-bearing streams or suitable fish spawning habitat or fish passage compatible stream segments.</p> <p><b>Waiver:</b> The AO may grant a waiver if it is determined that the entire lease area does not contain fish-bearing streams or suitable fish spawning habitat or fish passage compatible stream segments. This determination shall be based upon a BLM evaluation in coordination with the WGFD, as appropriate.</p>			
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<b>Management #</b>	4602			
<b>Protected Resource</b>	Special Status plant species.			
<b>RMP Affected Area</b>	Map 2-5			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	NSO	NSO	None	NSO
<b>Action Text</b>	Known locations of Special Status plant species communities would be protected and closed to: (1) surface disturbing activities or any disruptive activity that	Prohibit surface disturbing activities or any disruptive activity on known locations of Special Status plant species. Manage as: (1) NSO for fluid minerals; (2) withdrawal from	Avoid known locations of Special Status plant species for surface disturbing activities. Permit authorizations where applicants could demonstrate	Prohibit surface disturbing activities or any disruptive activity within 100 feet of the boundary of known locations of Special Status plant species.

	<p>could adversely affect the plants or their habitat, (2) the location of new mining claims (withdrawal from mineral location and entry under the land laws would be pursued) (3) mineral material sales, (4) all off-road vehicular use, including those vehicles used for geophysical exploration activities, surveying, etc., and (5) the use of explosives and blasting. (See the discussion Lands and Realty management and Minerals management.)</p>	<p>mineral location and entry under the land laws would be pursued; (3) closed to mineral material sales; (4) closed to all OHV vehicular use, including those vehicles used for geophysical exploration activities, surveying, etc.; (5) the use of explosives and blasting; (6) avoidance area for new ROW.</p>	<p>that proposed activities would not impact sensitive plant species. Manage as: (1) avoidance area for new ROW, (2) limit vehicle use to existing roads and trails.</p>	<p>NSO for fluid minerals. Petition to segregate and pursue a withdrawal from locatable mineral entry. Close to mineral material sales. Close to solid mineral leasing. Designate as a ROW avoidance area. Close to all OHV use, including those vehicles used for geophysical exploration activities, surveying, etc. Prohibit the use of explosives and blasting.</p>
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> No surface occupancy or use at known locations of any Special Status plant species. <b>Purpose:</b> To protect Special Status plants from activities that could adversely affect the plants or their habitat. <b>Exception:</b> The BLM AO can approve exceptions where applicants could demonstrate that proposed activities would not impact sensitive plant species. <b>Modification:</b> The AO may modify the boundaries of the stipulation area if: (1) a portion of the area is not being used by the identified species; (2)</p>	<p><b>Stipulation:</b> Same as A <b>Exception:</b> None <b>Modification:</b> None <b>Waiver:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> No surface occupancy or use within 100 feet of any Special Status plant species. <b>Purpose:</b> To protect Special Status plants from activities that could adversely affect the plants or their habitat. <b>Exception:</b> The BLM AO can approve exceptions where applicants could demonstrate that proposed activities would not impact sensitive plant species. <b>Modification:</b> The AO may modify the boundaries of the stipulation area if a portion of the area is not being used by the identified species.</p>

	<p>habitat outside of stipulation boundaries is being used and needs to be protected.</p> <p><b>Waiver:</b> This stipulation may be waived if the AO determines that the entire leasehold can be occupied without adversely affecting the resources.</p>			<p><b>Waiver:</b> This stipulation may be waived if the AO determines that the entire leasehold does not contain any Special Status plant species.</p>
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<b>Management #</b>	4610			
<b>Protected Resource</b>	Special status plant species.			
<b>RMP Affected Area</b>	Map 2-6			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	CSU	NSO	None	CSU
<b>Action Text</b>	<p>In the Jack Morrow Hills planning area, Special Status plant species potential habitat areas would be areas of CSU for surface disturbing activities related to oil and gas activities.</p> <p>Surface disturbing activities for other uses or projects may also be restricted or prohibited based on site-specific analysis.</p>	<p>Prohibit surface-disturbing activities in potential habitat areas of Special Status plant species.</p> <p>Manage as: (1) NSO for fluid minerals; (2) closed to mineral material sales/disposal; (3) closed to all solid mineral leasing; (4) pursue withdrawal from mineral location.</p>	<p>Place no limitations on surface-disturbing activities in potential habitat areas of Special Status plant species.</p>	<p>Allow surface-disturbing activities in Special Status plant species' mapped habitat, subject to adequate mitigation of impacts following BLM mitigation policies.</p> <ol style="list-style-type: none"> <li>1) CSU for fluid minerals</li> <li>2) Designate as a ROW avoidance area.</li> </ol>

<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> Restrict surface disturbing activities unless the operator submits a plan that adequately addresses mitigation of impacts following the BLM mitigation policies for Special Status plant species.</p> <p><b>Purpose:</b> To protect Special Status plants from activities that could adversely affect the plants or their habitat.</p> <p><b>Exception:</b> The BLM AO can approve exceptions where applicants could demonstrate that proposed activities would not impact sensitive plant species.</p> <p><b>Modification:</b> The AO may modify the boundaries of the stipulation area if: (1) a portion of the area is not being used by the identified species as determined by survey; (2) habitat outside of stipulation boundaries is being used and needs to be protected.</p> <p><b>Waiver:</b> This stipulation may be waived if the AO determines that the entire leasehold can be occupied without adversely affecting the resources.</p>	<p><b>Stipulation:</b> Prohibit surface occupancy or use in areas of Special Status plant species.</p> <p><b>Purpose:</b> To protect Special Status plants from activities that could adversely affect the plants or their habitat.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Same as A</p>
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<p><b>Management #</b></p>	<p>4613</p>
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<b>Protected Resource</b>	Big sagebrush/lemon scurfpea.			
<b>RMP Affected Area</b>	Base of Steamboat Mountain.			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	CSU	CSU	None	CSU
<b>Action Text</b>	In the Jack Morrow Hills Planning Area, some basin big sagebrush/lemon scurfpea areas along the base of Steamboat Mountain would be provided protection by controlling surface use or implementing other intense mitigation to preserve the character of vegetation communities. Implementation of healthy rangeland standards would ensure the viability of vegetation resources. Water developments would be considered only if the resource conditions are maintained or improved.	Protect some basin big sagebrush/lemon scurfpea areas along the base of Steamboat Mountain by controlling surface use or implementing other intense mitigation to preserve the character of vegetation communities.	No similar action	Avoid surface disturbing activities in basin big sagebrush/lemon scurfpea areas along the base of Steamboat Mountain, to preserve the character of this vegetation community.  1) CSU for fluid minerals. 2) Designate as a ROW avoidance area.
<b>Stipulation Description</b>	<b>Stipulation:</b> Restrict surface occupancy or use unless the operator submits a plan that adequately address mitigation of impacts following the BLM mitigation policies for big sagebrush/lemon scurfpea.  <b>Purpose:</b> To preserve the character of this vegetation community.	<b>Stipulation:</b> Same as A  <b>Exception:</b> None  <b>Modification:</b> None <b>Waiver:</b> None	<b>Stipulation:</b> None	<b>Stipulation:</b> Same as A  <b>Purpose:</b> To preserve the character of this vegetation community.  <b>Exception:</b> The BLM AO can approve exceptions where applicants could demonstrate that proposed activities would

	<p><b>Exception:</b> The BLM AO can approve exceptions where applicants could demonstrate that proposed activities would not impact big sagebrush/lemon scurfpea.</p> <p><b>Modification:</b> The AO may modify the boundaries of the stipulation area if a portion of the area is not being used by the identified species.</p> <p><b>Waiver:</b> This stipulation may be waived if the AO determines that the entire leasehold does not contain the protected resource.</p>			<p>not impact big sagebrush/lemon scurfpea.</p> <p><b>Modification:</b> The AO may modify the boundaries of the stipulation area if a portion of the area is not being used by the identified species.</p> <p><b>Waiver:</b> This stipulation may be waived if the AO determines that the entire leasehold does not contain the protected resource.</p>
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<b>Management #</b>	4614			
<b>Protected Resource</b>	Little Firehole's Cottonwood Canyon Area.			
<b>RMP Affected Area</b>	Map 2-6			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	None	NSO	None	NSO
<b>Action Text</b>	No similar action	The Little Firehole's Cottonwood Canyon area would be: (1) NSO for fluid minerals; (2) closed to mineral material sales/disposal; (3) closed to all solid mineral leasing; (4) pursue withdrawal from mineral location; (5) an exclusion area for new ROW.	No similar action	Allow, on a case-by-case basis, activities intended to protect or enhance the unique vegetative assemblage values in the Little Firehole's Cottonwood Canyon area.  Otherwise:



		<p>Pursue withdrawal from entry under land laws and mineral location.</p> <p>Prohibit surface disturbing activities, except for activities intended to protect or enhance the unique vegetative assemblage values.</p>		<p>NSO for fluid minerals.</p> <p>Close to mineral material sales/disposal.</p> <p>Close to all solid mineral leasing.</p> <p>Petition to segregate and pursue a withdrawal from locatable mineral entry.</p> <p>Designate an avoidance area for new ROW.</p>
<b>Stipulation Description</b>	<b>Stipulation:</b> None	<p><b>Stipulation:</b> No surface occupancy in the area of Little Firehole's Cottonwood Canyon as shown on BLM Map 2-6.</p> <p><b>Purpose:</b> To protect or enhance the unique vegetative assemblage values in the Little Firehole's Cottonwood Canyon area.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>	<b>Stipulation:</b> None	<p><b>Stipulation:</b> No surface occupancy in the Little Firehole's Cottonwood Canyon as shown on BLM Map 2-8.</p> <p><b>Purpose:</b> To protect or enhance the unique vegetative assemblage values in the Little Firehole's Cottonwood Canyon area.</p> <p><b>Exception:</b> The BLM AO can approve exceptions where applicants could demonstrate that proposed activities would not impact big sagebrush/lemon scurf pea.</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>

<b>Management #</b>	4623
<b>Protected Resource</b>	Mountain plover nesting habitat.

RMP Affected Area		Map 2-6			
Alternative	A	B	C	D	
<b>Stipulation</b>	TLS	TLS	TLS	TLS	
<b>Action Text</b>	<p>In the Jack Morrow Hills Planning Area, mountain plover surveys would be required prior to authorizing any surface disturbing or disruptive activities in potential plover habitat. Surveys would be conducted within suitable mountain plover habitat by a qualified biologist using protocol determined by the Rock Springs BLM Biologist.</p> <p>Active mountain plover nesting aggregation areas would be avoidance areas for surface disturbing and disruptive activities within ¼ mile of the area from April 10 to July 10.</p>	<p>Require mountain plover surveys prior to permitting surface disturbing or disruptive activities in potential plover habitat. Conduct surveys within suitable mountain plover habitat. Survey protocol would be conducted by a qualified biologist and follow best available science and methods as determined by the Rock Springs BLM Biologist.</p> <p>Prohibit surface disturbing and disruptive activities within ¼ mile of active mountain plover nesting aggregation areas from April 10 to July 10.</p>	<p>Require mountain plover surveys prior to permitting surface disturbing or disruptive activities in potential plover habitat. Conduct surveys within suitable mountain plover habitat. Survey protocol would be conducted by a qualified biologist and follow best available science and methods as determined by the Rock Springs BLM Biologist.</p> <p>Prohibit surface disturbing and disruptive activities within 100 feet of active mountain plover nesting aggregation areas from April 10 to July 10.</p>	<p>Require mountain plover surveys prior to permitting surface disturbing or disruptive activities in plover nesting habitat if the activities would occur during the mountain plover nesting season (April 10 to July 10). If active nests are located, no surface disturbing or disruptive activities would be allowed within ¼ mile until the end of the nesting season.</p> <p>Survey protocol would be conducted by a qualified biologist and follow best available science and methods as determined by the Rock Springs BLM Biologist.</p>	
<b>Stipulation Description</b>	<p><b>Stipulation:</b> No surface disturbing or disruptive activities are allowed within ¼ mile area of mountain plover nesting habitat during nesting season (April 10 to July 10).</p> <p><b>Purpose:</b> To protect mountain plover nesting</p>	<p><b>Stipulation:</b> Same as A</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None <b>Waiver:</b> None</p>	<p><b>Stipulation:</b> No surface disturbing or disruptive activities are allowed within 100 feet of mountain plover nesting habitat during nesting season (April 10 to July 10).</p> <p><b>Purpose:</b> To protect mountain plover nesting</p>	<p><b>Stipulation:</b> Restrict surface occupancy or use in area of mountain plover nesting habitat until a survey is conducted by a qualified biologist and a plan following best available science is submitted to the AO that will protect the area during nesting season (April 10 to July 10).</p>	

	<p>habitat during nesting season (April 10 to July 10).</p> <p><b>Exception:</b> An exception to this restriction or stipulation may be granted by the AO if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.</p> <p><b>Modification:</b> Consider modifications if: (1) there are no practical alternatives; (2) impacts can be fully mitigated; and (3) the action is designed to enhance the protected resource(s).</p> <p><b>Waiver:</b> This stipulation may be waived if the AO determines that the entire leasehold can be occupied without adversely affecting the resources.</p>		<p>habitat during nesting season (April 10 to July 10).</p> <p><b>Exception:</b> An exception to this restriction or stipulation may be granted by the AO if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.</p> <p><b>Modification:</b> Consider modifications if: (1) there are no practical alternatives; (2) impacts can be fully mitigated; and (3) the action is designed to enhance the protected resource(s).</p> <p><b>Waiver:</b> This stipulation may be waived if the AO determines that the entire leasehold can be occupied without adversely affecting the resources.</p>	<p><b>Purpose:</b> To protect mountain plover nesting habitat during nesting season (April 10 to July 10).</p> <p><b>Exception:</b> An exception to this restriction or stipulation may be granted by the AO if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.</p> <p><b>Modification:</b> The AO may modify the area subject to the stipulations based upon a BLM evaluation in coordination with WGFD and/or USFWS, as necessary. The stipulation may be modified based on monitoring results, or if it is determined that the action will not impair the function or the suitability of the habitat, or cause nest abandonment.</p> <p><b>Waiver:</b> The AO may grant a waiver if it is determined that the entire lease area does not contain suitable mountain plover habitat. This determination shall be based upon a BLM evaluation of the area in coordination with WGFD and/or USFWS, as necessary.</p>
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<b>Management #</b>	4624			
<b>Protected Resource</b>	Fish-bearing streams to protect spawning, egg incubation, and fry areas in Special Status fish-bearing streams.			
<b>RMP Affected Area</b>	Map 2-5			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	TLS	TLS	None	None
<b>Action Text</b>	In the Jack Morrow Hills Planning Area, seasonal limitations for surface disturbing activities to protect game and Special Status fish species during spawning would be applied (Appendix B).	Apply TLS to surface disturbing activities within ¼ mile of riparian areas along fish-bearing streams to protect spawning, egg incubation, and fry areas in Special Status fish-bearing streams. Apply spring TLS from March 15 to July 31 and fall TLS from September 15 to November 30. Critical dates often vary based on site location and species composition.  Manage as: (1) TLS for fluid minerals; (2) closed to all solid mineral leasing.  Evaluate, on a case-by-case basis, requests for exceptions to timing limitations. Exceptions could include reducing or increasing these standard dates (see Appendix B for specific exception/waiver/modification criteria). Consult on all requests with the WGFD.	Apply no TLS to surface disturbing activities to protect fisheries critical life stages.	No similar action (see general fish management in the Fish and Wildlife Section)

<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> No surface disturbing activities within fish-bearing stream from March 15 to July 31 and from September 15 to November 30.</p> <p><b>Purpose:</b> To protect spawning, egg incubation, and fry areas in Special Status fish-bearing streams during reproductive periods.</p> <p><b>Exception:</b> An exception to this restriction or stipulation may be granted by the AO if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated. Consultation with the WGFD may be required.</p> <p><b>Modification:</b> The AO may modify the boundaries of the stipulation area if: (1) a portion of the area is not being used for spawning by the identified species; (2) habitat outside of stipulation boundaries is being used and needs to be protected; or (3) the spawning patterns have changed causing a difference in the season of use. Consultation with the WGFD may be required.</p> <p><b>Waiver:</b> This stipulation may be waived if the AO determines that the entire leasehold can be occupied without adversely</p>	<p><b>Stipulation:</b> Same as A</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None <b>Waiver:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> None</p>
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	affecting the resources. Consultation with the WGFD may be required.			
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<b>Management #</b>	5008
<b>Protected Resource</b>	To protect steatite/soapstone sites.

RMP Affected Area				
Alternative	A	B	C	D
<b>Stipulation</b>	CSU	CSU	None	None
<b>Action Text</b>	<p>Management emphasis for the prehistoric quarry site would be for scientific data recovery. The prehistoric quarry site would be protected by closing it to mineral location and pursuing a withdrawal. The site is an exclusion area and is closed to surface disturbing activities that could adversely affect it. Only those surface disturbing activities related to data recovery would be allowed (see discussions in Lands and Realty Management and Minerals Management and Table 2 and Table 4.</p>	<p>Manage the prehistoric quarry sites (48SU1263, 0.11 acres and 48SU7632, 0.66 acres) to emphasize scientific information. Protect the site by closing it to mineral location and pursuing a withdrawal. Close the site to surface disturbing activities that could adversely affect it. Allow only those surface disturbing activities related to scientific investigation.</p> <p>Manage as: (1) CSU for fluid minerals; (2) closed to mineral material sales/disposal; (3) closed to all solid mineral leasing; (4) and exclusion area for new ROW.</p>	<p>Manage the prehistoric quarry sites (48SU1263, 0.11 acres and 48SU7632, 0.66 acres) to emphasize scientific information. Manage activities to mitigate potential adverse effects to the sites.</p>	<p>Manage the prehistoric quarry sites (48SU1263, 0.11 acres and 48SU7632, 0.66 acres) to emphasize scientific information. Petition to segregate and pursue a withdrawal from locatable mineral entry. Allow only those activities related to scientific investigation. Since prehistoric steatite/soapstone quarries are relatively rare and have been identified as a sensitive cultural resource during tribal consultation, projects proposed in the vicinity of steatite outcrops would require additional fieldwork and research, including tribal consultation, to determine if the outcrop is important to tribes and/or contains important scientific information.</p>
<b>Stipulation Description</b>	<b>Stipulation:</b> Restrict surface disturbing activities unless the activities are related to data recovery activities.	<b>Stipulation:</b> Same as A	<b>Stipulation:</b> None	<b>Stipulation:</b> None

	<p><b>Purpose:</b> To protect steatite/soapstone sites.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>			
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<b>Management #</b>	5012			
<b>Protected Resource</b>	NRHP sites.			
<b>RMP Affected Area</b>	Map 2-5			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	CSU	CSU	CSU	CSU
<b>Action Text</b>	<p>In the Jack Morrow Hills planning area, <u>sites eligible under NRHP Criteria A, B, or C</u>: All National Register- eligible historic sites would be protected through provisions of the NHPA and ARPA. Sites eligible under Criteria A, B, or C would be protected and mitigation measures would be developed on a case-specific basis depending on site values and proposed activity. Scientific data recovery may not be the appropriate mitigation strategy for these sites. Sites eligible for inclusion in the NRHP under Criterion D because of their</p>	<p>Avoid ground disturbing activities, including geophysical activities, on sites eligible for inclusion in the NRHP under Criterion D (because of their scientific information content) by at least 500 feet.</p> <p>This avoidance distance could be appropriate for sites eligible for the NRHP under other criteria and would be determined on a case-by-case basis. Develop appropriate mitigation measures if a site cannot be avoided.</p>	<p>Avoid ground disturbing activities, including geophysical activities, on sites eligible for inclusion in the NRHP under Criterion D (because of their scientific information content) by at least 100 feet.</p> <p>This avoidance distance could be appropriate for sites eligible for the NRHP under other criteria and would be determined on a case-by-case basis. Develop appropriate mitigation measures if a site cannot be avoided.</p>	<p>Avoid surface disturbing activities, including geophysical activities, on sites eligible for inclusion in the NRHP under Criterion D (because of their scientific information content) by at least 100 feet.</p> <p>This avoidance distance could be appropriate for sites eligible for the NRHP under other criteria and would be determined on a case-by-case basis. Develop appropriate mitigation measures if a site cannot be avoided.</p>



	<p>scientific information content would be surrounded by a minimum 100-foot avoidance area, pursuant to the Protocol Agreement between the BLM and SHPO. Eligible sites may be nominated to the NRHP. The BLM may work with partners to fund preparation of NRHP nominations on a case-by-case basis.</p>			
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> Restrict surface disturbing activities within 100 feet of any site that is eligible for inclusion in the NRHP under Criterion A, B, C, and D unless the operator provides an appropriate mitigation plan approved by the AO.</p> <p><b>Purpose:</b> To protect the scientific value of these NRHP sites.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include sites eligible under Criterion D.</p>	<p><b>Stipulation:</b> Restrict surface-disturbing activities within 500 feet of any site that is eligible for inclusion in the NRHP under Criterion D unless the operator provides an appropriate mitigation plan approved by the AO.</p> <p><b>Purpose:</b> To protect the scientific value of these NRHP sites.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>	<p><b>Stipulation:</b> Restrict surface-disturbing activities within 100 feet of any site that is eligible for inclusion in the NRHP under Criterion D unless the operator provides an appropriate mitigation plan approved by the AO.</p> <p><b>Purpose:</b> To protect the scientific value of these NRHP sites.</p>	<p><b>Stipulation:</b> Restrict surface-disturbing activities within 100 feet of any site that is eligible for inclusion in the NRHP under Criterion D unless the operator provides an appropriate mitigation plan approved by the AO.</p> <p><b>Purpose:</b> To protect the scientific value of these NRHP sites.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include</p>

	This determination shall be based upon BLM evaluation or environmental record of review.			sites eligible under Criterion D. This determination shall be based upon BLM evaluation or environmental record of review.
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<b>Management #</b>	5100			
<b>Protected Resource</b>	Rock art sites at Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar, and White Mountain.			
<b>RMP Affected Area</b>	Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar, White Mountain.			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	NSO	NSO	None	NSO, CSU
<b>Action Text</b>	Five significant rock art sites and their surrounding viewshed (within ½ mile) would be managed to protect their cultural and historical values. Surface disturbing activities and visual intrusions would be prohibited within these areas if they would adversely affect these values. Management of visitor use at rock art sites may include interpretive signing, fencing, barriers, and other activities.	Manage significant rock art sites (including both prehistoric and historic inscriptions) and their surrounding viewshed (the actual area that can be seen from the rock art sites, within three-miles) to protect their cultural and historical values. These would include but would not be limited to: <ol style="list-style-type: none"> <li>1) Cedar Canyon – 311 acres + 4,008 viewshed acres</li> <li>2) LaBarge Bluffs – 5 acres + 5,008 viewshed acres</li> <li>3) Sugarloaf – 20 acres + 371 viewshed acres</li> </ol>	Manage significant rock art sites (including both prehistoric and historic inscriptions) and their surrounding viewshed (the actual area that can be seen from the rock art sites, within ¼ mile) to protect their cultural and historical values. These would include but would not be limited to: <ol style="list-style-type: none"> <li>1) Cedar Canyon – 311 acres + 126 viewshed acres</li> <li>2) LaBarge Bluffs – 20 acres + 103 viewshed acres</li> <li>3) Sugarloaf – 20 acres + 49 viewshed acres</li> <li>4) Tolar – 20 acres + 61 viewshed acres</li> </ol>	Manage significant rock art sites (including both prehistoric and historic inscriptions) and their surrounding setting within ½ mile to protect Native American, cultural and historical values. These include: <ol style="list-style-type: none"> <li>1) Cedar Canyon - 21.7 acres</li> <li>2) LaBarge Bluffs - 5 acres</li> <li>3) Sugarloaf - 2.3 acres</li> <li>4) Tolar - 8.3 acres</li> <li>5) White Mountain - 21.6 acres</li> </ol>

		<p>4) Tolar – 20 acres + 1,512 viewshed acres</p> <p>5) White Mountain – 20 acres + 4,780 viewshed acres</p> <p>Prohibit surface disturbing activities, visual intrusions and audible intrusions, within these areas.</p> <p>Manage as: (1) NSO for fluid minerals; (2) closed to mineral material sales/disposal; (3) closed to all solid mineral leasing; (4) pursue withdrawal from mineral location; (5) an exclusion area for new ROW.</p> <p>Management of visitor use at rock art sites could include interpretive signing, fencing, barriers, and other activities.</p>	<p>5) White Mountain – 20 acres + 115 viewshed acres.</p> <p>Management of visitor use at rock art sites could include interpretive signing, fencing, barriers, and other activities.</p>	<p><b>The rock art site (excluding the ½ mile setting):</b></p> <ol style="list-style-type: none"> <li>1) Prohibit surface occupancy</li> <li>2) NSO for fluid minerals</li> <li>3) Close to mineral material sales/disposal</li> <li>4) Maintain existing withdrawals (Sugarloaf petroglyphs (5 acres) and White Mountain (20 acres) and pursue new withdrawals for mineral location</li> <li>5) Designate as a ROW exclusion area</li> <li>6) Allow subsurface mining only if a site-specific analysis determines no adverse effects will occur</li> <li>7) Designate as visual resource management (VRM) Class II.</li> </ol> <p><b><u>Setting (within ½ mile of site):</u></b></p> <p>Allow surface disturbing activities, visual, audible and atmospheric intrusions only if they do not adversely affect Native American, cultural or historical values.</p> <ol style="list-style-type: none"> <li>1) CSU for fluid minerals</li> <li>2) Designate as VRM Class II.</li> </ol>
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<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> No surface disturbing activities within the significant rock art sites.  <b>Purpose:</b> To protect significant rock art sites.  <b>Exception:</b> None  <b>Modification:</b> None  <b>Waiver:</b> None</p>	<p><b>Stipulation:</b> Same as A  <b>Exception:</b> None  <b>Modification:</b> None <b>Waiver:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> NSO: No surface occupancy or use within the White Mountain, Cedar Canyon, Tolar, La Barge and Sugarloaf rock artsites.  <b>Purpose:</b> To protect significant rock art sites.  <b>Exception:</b> None  <b>Modification:</b> None  <b>Waiver:</b> None  <u>Viewshed</u>  CSU: Standard Lease Stipulation 1.  <b>Purpose:</b> To protect significant rock art sites.  <b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will meet the performance standards above.  <b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review.  <b>Waiver:</b> The BLM AO determines that the entire lease area is not within a rock art site or its viewshed. This determination shall be based upon BLM evaluation or environmental record of review.</p>
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<b>Management #</b>	5109			
<b>Protected Resource</b>	Blue Point, Blue Forest, Adobe Town Rim, Cedar Canyon and the Bozovich site complex as historic districts.			
<b>RMP Affected Area</b>	Map 2-6			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	CSU	NSO	None	None
<b>Action Text</b>	<p>Playa Lake areas with high cultural site density would be managed as historic districts. Management prescriptions for surface disturbing activities in playa lake areas would be developed on a case-by-case basis. A programmatic memorandum of agreement for data recovery with the SHPO and ACHP would also be pursued. Each playa may be managed as an NRHP eligible historic district (Blue Forest, Blue Point, and AdobeTown Rim).</p>	<p>Manage areas with high cultural resource density suchas Blue Point, Blue Forest, Adobe Town Rim, Cedar Canyon and the Bozovich sitecomplex (Map 2-6) as historicdistricts.</p> <p>Close these areas to surface disturbing activities that could adversely affect the cultural resources, but would be openfor consideration of activities such as fencing, interpretive signs, or barriers to ensure protection of the area.</p> <p>Manage as: (1) NSO for fluid minerals; (2) closed to mineral material sales/disposal; (3) closed to all solid mineral leasing.</p> <p>Encourage appropriate scientific study of sites in this area.</p>	No similar action	No similar action

		<p>Develop management prescriptions for surface disturbing activities in these areas on a historic district level.</p>		
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> Restrict surface-disturbing activities in the Playa Lake area unless a memorandum of agreement is developed.</p> <p><b>Purpose:</b> To protect the Blue Point, Blue Forest, Adobe Town Rim, Cedar Canyon and the Bozovich site complex as historic districts.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area is not within a site complex listed above. This determination shall be based upon BLM evaluation or environmental record of review.</p>	<p><b>Stipulation:</b> No surface disturbing activities allowed in these areas.</p> <p><b>Purpose:</b> To protect the Blue Point, Blue Forest, Adobe Town Rim, Cedar Canyon and the Bozovich site complex as historic districts.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> None</p>

<b>Management #</b>	5112 and 5113			
<b>Protected Resource</b>	Known human burial sites.			
<b>RMP Affected Area</b>				
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	NSO	NSO	NSO	NSO
<b>Action Text</b>	<p>All known human burial sites would be protected regardless of their ethnic affiliation. Management of Native American burial sites would take into account recommendations from appropriate tribes. Data recovery would not be the preferred method for mitigation of adverse effects to any burial location.</p> <p><b># 5113</b></p> <p>Known burial areas would be closed to surface disturbing activities that could adversely affect them (see discussions in Lands and Realty Management and Minerals Management and Table 2).</p>	<p>Close all known human burial sites, regardless of their ethnic affiliation, to surface disturbing activities that could adversely affect the sites.</p> <p>Manage as: (1) NSO for fluid minerals; (2) closed to mineral material sales/disposal; (3) closed to all solid mineral leasing; (4) an exclusion area for all new ROW.</p> <p>Management of Native American burial sites would take into account recommendations from appropriate tribes.</p> <p>Excavation/data recovery would not be the preferred method for mitigation of adverse effects to any burial location.</p>	<p>Same as alternative A</p>	<p>Close all known human burial sites, regardless of their ethnic affiliation, to surface disturbing activities that could adversely affect the sites.</p> <p>Manage as:</p> <ol style="list-style-type: none"> <li>1) NSO for fluid minerals</li> <li>2) Close to mineral material sales/disposal</li> <li>3) Designate an exclusion area for all new ROW.</li> </ol> <p>Consult with appropriate tribes regarding management of Native American burial sites.</p> <p>Excavation/data recovery would not be the preferred method for mitigation of adverse effects to any burial location.</p>
<b>Stipulation Description</b>	<p><b>Stipulation:</b> No surface occupancy would be allowed within known human burial sites.</p>	<p><b>Stipulation:</b> Same as A</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p>	<p><b>Stipulation:</b> Same as A</p>	<p><b>Stipulation:</b> Same as A</p>

	<p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include human burials. This determination shall be based upon BLM evaluation or environmental record of review.</p>	<p><b>Waiver:</b> None</p>		
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<b>Management #</b>	5114			
<b>Protected Resource</b>	Boyer Ranch House and Dug Springs Stage.			
<b>RMP Affected Area</b>	Boyer Ranch (10 acres) and Dug Springs Stage Station (10 acres).			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	NSO	NSO	None	CSU
<b>Action Text</b>	LaCledde Stage Station and Dug Springs Stage Station on the Overland Trail would be protected as exclusion areas and would be closed to surface disturbing activities that could adversely affect the	Close the Boyer Ranch House (formerly LaCledde Stage Station) (10 acres) and Dug Springs Stage Station (10 acres) on the Overland Trail to surface disturbing activities	No similar action	Allow surface disturbing activities at the Boyer Ranch House (formerly LaCledde Stage Station) (10 acres) and Dug Springs Stage Station (10 acres) on the Overland Trail or their setting only if they do not



	<p>sites. These sites would be closed to exploration and development of locatable minerals and entry under the land laws, and withdrawals would be pursued. Interpretive and visitor management efforts would be allowed as necessary (see discussions in Lands and Realty Management and Minerals Management; see also Table 2 and Table 4).</p>	<p>that could adversely affect the sites.</p> <p>Manage as: (1) NSO for fluid minerals; (2) closed to mineral material sales/disposal; (3) closed to all solid mineral leasing; (4) petition to segregate and pursue withdrawal from mineral location; (5) an exclusion area for ROW.</p> <p>Cultural resource management plans could be written for these sites and interpretive and visitor management efforts would be allowed as necessary.</p>		<p>adversely affect the cultural values of the sites.</p> <p>CSU for fluid minerals.</p> <p>Petition to segregate and pursue withdrawal from mineral location.</p>
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> No surface disturbing activities would be allowed that would adversely affect the cultural values of the sites.</p> <p><b>Purpose:</b> To protect the cultural values of the Boyer Ranch House and the Dug Springs Stage Station.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>	<p><b>Stipulation:</b> Same as A</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Surface occupancy or use may be restricted or prohibited within the site of the Dug Springs Stage Station and Boyer Ranch House.</p> <p><b>Purpose:</b> To protect the cultural values of the Boyer Ranch House and the Dug Springs Stage Station.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a</p>

				BLM evaluation or environmental record of review.  <b>Waiver:</b> The BLM AO determines that the entire lease area does not include either of the sites listed above. This determination shall be based upon BLM evaluation or environmental record of review.
<b>Management #</b>	5116			
<b>Protected Resource</b>	Crookston Ranch.			
<b>RMP Affected Area</b>	40 acres			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	None	None	None	NSO
<b>Action Text</b>	No similar action	No similar action	No similar action	The Crookston Ranch site, approximately 40 acres. NSO for fluid minerals. Petition to segregate and pursue withdrawal from mineral location. Close to mineral material sales. Close to solid mineral leasing. Designate as a ROW exclusion area.

				<p>Prohibit geophysical activities such as shothole, blasting, and vibroseis locations within ¼ mile from the site.</p> <p>Allow geophysical activities outside of ¼ mile only after a site specific analysis determines that visual intrusions and adverse effects would not occur.</p> <p>Allow non-mineral development surface disturbing activities at the site and within ½ mile of the site, only if they do not adversely affect the cultural values of the site.</p>
<b>Stipulation Description</b>	<b>Stipulation:</b> None	<b>Stipulation:</b> None	<b>Stipulation:</b> None	<p><b>Stipulation: NSO:</b> No surface occupancy within the 40 acres of the Crookston Ranch site.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>

<b>Management #</b>	5202			
<b>Protected Resource</b>	Indian Gap Area inside Steamboat Mountain ACEC.			
<b>RMP Affected Area</b>	Map 2-5			
<b>Alternative</b>	A	B	C	D

<b>Stipulation</b>	NSO	None	None	None
<b>Action Text</b>	The Indian Gap will be managed as part of the Steamboat Mountain ACEC. A portion of Indian Gap will be closed to surface disturbing and disruptive activities. The remainder of Indian Gap will be open to consideration of surface disturbing and disruptive activities with mitigation to protect resource values (Table 2-12 and Map 2-29).	No similar action	No similar action	No similar action
<b>Stipulation Description</b>	<p><b>Stipulation:</b> No surface disturbing activities will be allowed in the portion of Indian Gap that is inside the Steamboat Mountain ACEC.</p> <p><b>Purpose:</b> To protect the resources of the Indian Gap Area inside Steamboat Mountain ACEC.</p> <p><b>Exception:</b> Consider exceptions if exploration and development would not impair identified scenic and primitive or semi-primitive recreational resources or Native American cultural values. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes.</p> <p><b>Modification:</b> The stipulated area may be modified by the</p>	<b>Stipulation:</b> None	<b>Stipulation:</b> None	<b>Stipulation:</b> None

	<p>AO if the boundaries are changed. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes.</p> <p><b>Waiver:</b> A waiver may be granted if the restriction violates the leaseholder/operator lease rights. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes.</p>			
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<b>Management #</b>	5305			
<b>Protected Resource</b>	Adobe Town and Desolation Flats/Desolation Point areas.			
<b>RMP Affected Area</b>	Map 2-6			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	None	NSO	None	None
<b>Action Text</b>	No similar action	<p>Prohibit surface disturbing activities in the Adobe Town and Desolation Flat/DesolationPoint areas.</p> <p>Manage as: (1) NSO for fluid minerals; (2) closed to mineral material sales/disposal; (3) closed to all solid mineral leasing.</p>	No similar action	No similar action

<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> No surface occupancy or use is allowed in the area of Adobe Town and Desolation Flats/Desolation Point.   <b>Purpose:</b> To protect the paleontological resources of Adobe Town and Desolation Flats/Desolation Point areas.   <b>Exception:</b> None  <b>Modification:</b> None  <b>Waiver:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> None</p>
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<p><b>Management #</b></p>	<p>5308</p>			
<p><b>Protected Resource</b></p>	<p>Farson Fossil Fish Beds.</p>			
<p><b>RMP Affected Area</b></p>	<p>Map 2-8</p>			
<p><b>Alternative</b></p>	<p>A</p>	<p>B</p>	<p>C</p>	<p>D</p>
<p><b>Stipulation</b></p>	<p>None</p>	<p>None</p>	<p>None</p>	<p>CSU</p>
<p><b>Action Text</b></p>	<p>No similar action</p>	<p>No similar action</p>	<p>No similar action</p>	<p>Allow surface disturbing activities on a case-by-case basis in the Farson Fossil Fish Beds (see Map 2-8), subject to adequate mitigation of impacts following BLM mitigation policies.                   Designate as a ROW avoidance area.</p>

				BLM (or BLM paleontological staff) may write and implement a site protection plan for the Farson Fossil Fish Beds and other significant fossil localities as they are identified.
<b>Stipulation Description</b>	<b>Stipulation:</b> None	<b>Stipulation:</b> None	<b>Stipulation:</b> None	<p><b>Stipulation:</b> Restrict surface disturbing activities in the area of the Farson Fossil Fish Beds unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated adverse impacts.</p> <p><b>Purpose:</b> To protect the paleontological values of the Farson Fossil Fish Beds.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area is not within the Farson Fossil Fish Beds. This determination shall be based upon a BLM evaluation or environmental record of review.</p>

<b>Management #</b>	6516			
<b>Protected Resource</b>	Developed recreation sites.			
<b>RMP Affected Area</b>	Map 2-6			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	NSO	NSO	None	NSO
<b>Action Text</b>	<p>Surface disturbing activities are prohibited within ¼ mile of recreation sites unless such activities are determined to be compatible with or are done for meeting recreation objectives for the area.</p> <p>Generally, such activities (e.g., those associated with mineral development, roads, pipelines, powerlines, etc.) would be designed to avoid these areas. These areas would be open to development of recreation site facilities. An approved plan would be required prior to the site disturbance.</p>	<p>Prohibit surface disturbing activities within three-miles or the visual horizon, whichever is closer, of developed recreation sites unless such activities are determined to be compatible with or are done for meeting recreation objectives for the area.</p> <p>Manage as: (1) NSO for fluid minerals; (2) closed to mineral material sales/disposal; (3) closed to all solid mineral leasing.</p> <p>These areas would be open to development of recreation site facilities. Require an approved plan prior to the site disturbance.</p>	No similar action	<p>Allow surface disturbing activities within ¼ mile of developed recreation sites on a case-by-case basis, only if they do not adversely impact recreational uses and objectives for the area.</p> <p>Manage as an NSO for fluid minerals.</p>
<b>Stipulation Description</b>	<p><b>Stipulation:</b> Prohibit surface occupancy and use within ¼ mile of developed recreation sites.</p> <p><b>Purpose:</b> To protect the recreation sites so they aren't adversely impacted.</p>	<p><b>Stipulation:</b> Prohibit surface occupancy and use within three-miles of developed recreation sites.</p> <p><b>Purpose:</b> To protect the recreation sites so they aren't adversely impacted.</p>	<b>Stipulation:</b> None	<p><b>Stipulation:</b> Prohibit surface occupancy within ¼ mile of developed recreation sites until an operator submits to the AO a plan that demonstrates will not</p>



	<p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>	<p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>		<p>adversely impact recreational uses for the area.</p> <p><b>Purpose:</b> To protect the recreation sites so they are not adversely impacted.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>
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<b>Management #</b>	6523
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<b>Protected Resource</b>	The Continental Divide Snowmobile Trail and South Pass Cross Country Ski Trail.			
<b>RMP Affected Area</b>	Map 2-8			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	NSO	None	CSU	None
<b>Action Text</b>	The integrity of the Continental Divide Snowmobile Trail and the South Pass Cross Country Ski Trail would be maintained by limiting (and in some cases precluding) surface disturbing activities or facilities on or within ¼ mile of the trails. The only exceptions would be the establishment of facilities to provide services to the users of the trails and to provide for public health and safety.	No similar action. The Continental Divide Snowmobile Trail and the South Pass Cross Country Ski Trail SRMA would not be retained	Manage the Continental Divide Snowmobile Trail.  Limit or prohibit surface disturbing activities or facilities on or within ¼ mile on the Continental Divide Snowmobile Trail.  Manage as a CSU for fluid minerals.  The Continental Divide Snowmobile trail system could be expanded by adding loop trails.  Do not retain the South Pass Cross Country Ski Trail.	Do not retain the South Pass Cross Country Ski Trail. See Wind River Front SRMA.
<b>Stipulation Description</b>	<b>Stipulation:</b> Prohibit surface occupancy or use within ¼ mile of the Continental Divide Snowmobile Trail.  <b>Purpose:</b> To protect the Continental Divide Snowmobile Trail and South Pass Cross Country Ski Trail.  <b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet	<b>Stipulation:</b> None	<b>Stipulation:</b> Restrict surface disturbing activities within ¼ mile of the Continental Divide Snowmobile Trail unless the operator can submit a plan that demonstrates that impact from the proposed action can be fully mitigated or activities be shown to benefit the resource objectives.	<b>Stipulation:</b> None

	<p>the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>		<p><b>Purpose:</b> To protect the Continental Divide Snowmobile Trail.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>	
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<b>Management #</b>	6525
<b>Protected Resource</b>	Continental Divide National Scenic Trail (CDNST) and Connecting Side Trail consistent with the National Direction for the CDNST.

RMP Affected Area		Map 2-8			
Alternative	A	B	C	D	
<b>Stipulation</b>	NSO	None	CSU	None	
<b>Action Text</b>	The integrity of the Continental Divide National Scenic Trail would be maintained by limiting (and in some cases precluding) surface disturbing activities or facilities on or within ¼ mile of the trails. The only exceptions would be the establishment of facilities to provide services to the users of the trails and to provide for public health and safety.	No similar action. The Continental Divide National Scenic Trail SRMA would not be retained.	Manage the Continental Divide National Scenic Trail and Connecting Side Trail consistent with the National Direction for the CDNST and guidance in the National Scenic and Historic Trails Manuals.  Limit or prohibit surface disturbing activities or facilities on or within ¼ mile on the Continental Divide Snowmobile Trail.  Manage as: (1) CSU for fluid minerals, (2) closed to all solid mineral leasing.  The Continental Divide Snowmobile trail system could be expanded by adding loop trails.	No similar action, see the Congressionally Designated Trails Section (7000-7022)	
<b>Stipulation Description</b>	<b>Stipulation:</b> Prohibit surface occupancy or use within ¼ mile of the CDNST and Connecting Side Trail consistent with the National Direction for the CDNST.  <b>Purpose:</b> To protect cultural values of the CDNST and Connecting Side Trail	<b>Stipulation:</b> None	<b>Stipulation:</b> Restrict surface disturbing activities within ¼ mile of the CDNST and Connecting Side Trail consistent with the National Direction for the CDNST unless the operator can submit a plan that demonstrates that impact from the proposed action can be	<b>Stipulation:</b> None	

	<p>consistent with the National Direction for the CDNST.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>		<p>fully mitigated or activities be shown to benefit the resource objectives.</p> <p><b>Purpose:</b> To protect cultural values of the CDNST and Connecting Side Trail consistent with the National Direction for the CDNST.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>	
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<b>Management #</b>	6534			
<b>Protected Resource</b>	Killpecker Sand Dunes Special Management Area.			
<b>RMP Affected Area</b>	Map 2-7			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	None	None	NSO	NSO
<b>Action Text</b>	No similar action	No similar action. The Killpecker Sand Dunes Special Recreation Management Area would not be retained.	Allow surface disturbing activities only if the purpose of the activity is to benefit the resource objectives.  NSO for fluid minerals.  Segregate and pursue withdrawal to mineral entry.  Prohibit geophysical activities such as shothole, blasting, and vibroseis locations.	Allow surface disturbing activities only if the purpose of the activity is to benefit the resource objectives.  1. NSO for fluid minerals 2. Segregate and pursue withdrawal to mineral entry in the Basin Gardensplay RMZ 3. Close to mineral material sales 4. Prohibit geophysical activities such as shothole, blasting, and vibroseis locations.
<b>Stipulation Description</b>	<b>Stipulation:</b> None	<b>Stipulation:</b> None	<b>Stipulation:</b> Prohibit surface occupancy or use within the Killpecker Sand Dunes Special Management Area unless a plan is submitted by the operator to the AO that shows that the activities do not adversely affect the resource objectives.  <b>Purpose:</b> To protect the resource objectives of the	<b>Stipulation:</b> Same as C

			<p>Killpecker Sand Dunes Special Management Area.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>	
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<b>Management #</b>	6538
<b>Protected Resource</b>	The Oregon and Mormon Pioneer National Historic Trails Special Recreation Management Area.
<b>RMP Affected Area</b>	Map 2-7

Alternative	A	B	C	D
<b>Stipulation</b>	None	None	NSO	None
<b>Action Text</b>	No similar action	No similar action. The Oregon and Mormon Pioneer National Historic Trails Special Recreation Management Area would not be retained.	<p>Allow surface disturbing activities only if the purpose of the activity is to benefit the resource objectives.</p> <ol style="list-style-type: none"> <li>1. NSO for fluid minerals</li> <li>2. Close to mineral material sales</li> <li>3. Designate as a ROW avoidance area</li> </ol> <p>Prohibit geophysical activities such as shothole, blasting, and vibroseis locations.</p>	Same as Alternative B
<b>Stipulation Description</b>	<b>Stipulation:</b> None	<b>Stipulation:</b> None	<p><b>Stipulation:</b> No surface disturbing activities are allowed in the Oregon and Mormon Pioneer National Historic Trails Special Recreation Management Area unless a plan is submitted by the operator to the AO that shows that the activities do not adversely effect the resource objectives.</p> <p><b>Purpose:</b> To protect the resource objectives of the Oregon and Mormon Pioneer National Historic Trails Special Recreation Management Area.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action</p>	<b>Stipulation:</b> None



			<p>meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>	
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<b>Management #</b>	6547			
<b>Protected Resource</b>	Wind River Front SRMA Eastern Unit.			
<b>RMP Affected Area</b>	82,107 acres			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	Closed	None	None	Closed
<b>Action Text</b>	This unit of the SRMA is closed to mineral leasing.	Do not retain the Wind River Front Special Recreation Management Area.	No similar action	This unit of the SRMA is closed to mineral leasing.
<b>Stipulation Description</b>	<b>Stipulation:</b> None	<b>Stipulation:</b> None	<b>Stipulation:</b> None	<b>Stipulation:</b> None

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<b>Management #</b>	6553
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<b>Protected Resource</b>	1 ½ mile of the Big Sandy River.			
<b>RMP Affected Area</b>	Map 2-5			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	NSO	None	NSO	None
<b>Action Text</b>	<p>The public lands along about 1 ½ miles of the Big Sandy River, adjacent to the Bridger-Teton Forest boundary, would be managed to retain their inherent pristine character. Actions that would alter these characteristics in this area are prohibited. Along this segment of the Big Sandy River, and within a ½ mile of either bank of the river, the public lands are closed to surface disturbing activities. A no surface occupancy requirement would be imposed on the area including the river and within ½ mile of either bank of the river</p>	<p>Do not retain the Wind River Front Special Recreation Management Area.</p>	<p>Prohibit, on a case-by-case basis, surface disturbing activities (NSO) consistent with other resources and resource uses along about 1 ½ miles of the Big Sandy River, adjacent to the Bridger-Teton Forest boundary and within a ½ mile of either bank of the river.</p>	<p>No similar action</p>
<b>Stipulation Description</b>	<p><b>Stipulation:</b> Prohibit surface occupancy and use within ½ mile of either side of river bank.</p> <p><b>Purpose:</b> To protect the resource value of wild and scenic rivers.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Prohibit surface occupancy within ½ mile of either side of the river bank unless the operator provides an appropriate mitigation plan approved by the AO.</p> <p><b>Purpose:</b> To protect the resource value of wild and scenic rivers.</p>	<p><b>Stipulation:</b> None</p>

	<p>not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>		<p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>	
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<b>Management #</b>	7003			
<b>Protected Resource</b>	National Historic Trails.			
<b>RMP Affected Area</b>	Map 2-6			
<b>Alternative</b>	A	B	C	D

Stipulation	None	CSU	None	CSU
<b>Action Text</b>	No similar action	Subject all actions within five to 15 miles on each side of the NHTs, except for highly visible projects and/or projects out of scale with the surrounding environment (e.g. wind farms, gas plants, large transmission lines, and power plants), to the following restrictions: (1) open to mineral leasing with CSU restrictions; (2) open to mineral material sales with CSU restrictions; (3) open to locatable minerals; (4) is a ROW avoidance area with CSU restrictions.	No similar action	<p>Apply the following actions within the National Trail Management Corridor:</p> <p>National Trail Management Corridor is a CSU for fluid minerals. Surface disturbing activities will be prohibited if the project causes more than a weak contrast to the setting of the National Historic and Scenic Trails.</p> <p>Designate as a ROW avoidance area.</p> <p>Allow new ROWs if it is determined by the AO that impacts associated with the action will not cause an adverse effect to the National Historic and Scenic Trails.</p> <p>Allow mineral material disposals if it is determined by the AO that impacts associated with the action will not cause an adverse effect to the National Historic and Scenic Trails.</p> <p>Allow new surface disturbing activities only if they will not cause an adverse effect to the National Historic and Scenic Trails.</p>
<b>Stipulation Description</b>	<b>Stipulation:</b> None	<b>Stipulation:</b> Restrict surface disturbing activities within the National Trails Management	<b>Stipulation:</b> None	<b>Stipulation:</b> Restrict surface disturbing activities within the National Trails Management

		<p>Corridor if the project will cause an adverse effect or cause more than a weak contrast to the setting of the NHT.</p> <p><b>Purpose:</b> To protect the National Historic Trails and their setting.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None <b>Waiver:</b> None</p>		<p>Corridor if the project will cause an adverse effect or cause more than a weak contrast to the setting of the NHT.</p> <p><b>Purpose:</b> To protect the National Historic Trails and their setting.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area is not within the National Trails Management Corridor. This determination shall be based upon BLM evaluation or environmental record of review.</p>
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<b>Management #</b>	7013			
<b>Protected Resource</b>	Parting-of-the-Ways historical site.			
<b>RMP Affected Area</b>	Map 2-6			
<b>Alternative</b>	A	B	C	D

Stipulation	None	NSO	NSO	NSO
<b>Action Text</b>	<p>The Parting-of-the-Ways historical site would be protected by closing it to exploration and development of locatable and saleable minerals and pursuing a withdrawal from mineral location. An existing 40-acre mineral location withdrawal in the area would be retained (Table 3). The site would be managed under the prescriptions for management in the <i>Oregon/Mormon Pioneer National Historic Trails Management Plan</i>.</p>	<p>Prohibit surface disturbing activities in the Parting-of-the-Ways historical site that would adversely affect it.</p> <p>Retain the existing 40 acre mineral withdrawal.</p>	<p>Same as Alternative B except the 40 acre withdrawal would not be retained once it expires.</p>	<p>Prohibit surface disturbing activities in the Parting-of-the-Ways historical site that would adversely affect it.</p> <p>Retain the existing 40-acre mineral withdrawal.</p> <p>NSO for fluid minerals.</p>
<b>Stipulation Description</b>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Surface occupancy and use will be prohibited at the Parting-of-the-Ways historical site.</p> <p><b>Purpose:</b> To protect the Parting-of-the-Ways historical site.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>	<p><b>Stipulation:</b> Surface occupancy and use will be prohibited at the Parting-of-the-Ways historical site.</p> <p><b>Purpose:</b> To protect the Parting-of-the-Ways historical site.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review.</p>	<p><b>Stipulation:</b> Same as C</p>

			<p><b>Waiver:</b> The BLM AO determines that the entire lease area is not within the Parting-of-the-Ways historical site. This determination shall be based upon BLM evaluation or environmental record of review.</p>	
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<b>Management #</b>	7017			
<b>Protected Resource</b>	Historic roads and trails that are eligible for the NRHP but not congressionally designated.			
<b>RMP Affected Area</b>	Map 2-6			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	None	NSO, CSU	None	NSO
<b>Action Text</b>	<p>Management of historic roads and trails that are eligible for the NRHP but are not congressionally designated would generally be the same as for designated trails including a ¼-mile protective setback on either side of the trails. These trails may be recommended for listing to the National Register of Historic Places. These trails include the Overland Trail, the Cherokee Trail, and the Point of Rocks to South Pass Road.</p>	<p>Manage historic roads and trails that are eligible for the NRHP but are not congressionally designated (these include but are not limited to the Overland Trail, the Cherokee Trail, the Point of Rocks to South Pass Road and other Expansion Era roads and trails), as follows:</p> <ol style="list-style-type: none"> <li>1) Within ½ mile on either side of an intact trail or road segment, unless the proposed project and its associated impacts are not visible from the road or trail, would be:                     <ol style="list-style-type: none"> <li>(1) open to</li> </ol> </li> </ol>	<p>Manage on a case-by-case basis based on their resource values, historic roads and trails that are eligible for the NRHP but are not congressionally designated (these include but are not limited to the Overland Trail, the Cherokee Trail, the Point of Rocks to South Pass Road and other Expansion Era roads and trails).</p> <p>Provided such actions do not occur directly on the historic road, actions along the intact road or trail segments would be:</p>	<p>Historic roads and trails that are eligible for the NRHP but are not congressionally designated (these include but are not limited to the Point of Rocks to South Pass Road and other Expansion Era roads and trails) will be managed according to their historical context as follows.</p> <p>Actions within 500 feet of a contributing segment of road or trail:</p> <ol style="list-style-type: none"> <li>1) NSO for fluid minerals.</li> <li>2) Designate as a ROW avoidance area.</li> </ol>



		<p>mineral leasing with NSO restrictions; (2) closed to mineral material sales; (3) an exclusion area for new ROW; (4) pursue withdrawals; (5) petition to segregate and pursue withdrawal from mineral location.</p> <p>2) ½ to two-miles on each side of the intact road or trail segment, unless the proposed project and its associated impacts are not visible from the road or trail, would be: (1) open to mineral leasing with NSO restrictions; (2) closed to mineral material sales; (3) an exclusion area for new right-of-way; (4) open to locatable minerals.</p> <p>3) Two to five-miles on each side of the intact road or trail segment, unless the proposed project and its associated impacts are not visible from the road or trail, would be: (1) open to mineral leasing with CSU restrictions; (2) open to mineral material sales with CSU restrictions; (3) open to new right-of-way with CSU restrictions; (4) open to locatable minerals.</p> <p>4) Deny highly visible projects and/or projects out of scale with the surrounding</p>	<p>1) Open to mineral leasing with standard lease stipulations</p> <p>2) Open to mineral material sales</p> <p>3) Open to new ROW</p> <p>4) Open to locatable minerals</p> <p>5) Manage highly visible projects and/or projects out of scale with the surrounding environment (e.g. wind farms, gas plants, and power plants) with the following restrictions from zero to five miles on each side of intact segments of the road or trail unless the project and its associated impacts are not visible from the road or trail.</p> <p>Should any roads or trails be congressionally designated as part of the NHT system, they would be managed according to the prescriptions set forth in the National Historic Trails section.</p> <p>Various Expansion Era (i.e., 1870-1940) roads would be managed according to their historical context. Era roads are those routes developed after establishment of the Transcontinental Railroad in Wyoming in 1869.</p> <p>Management prescriptions</p>	<p>For most projects, the setting will be analyzed out to one mile on either side of contributing segments of the historic roads and trails.</p> <p>For highly visible projects, impacts to setting will be analyzed on a case by case basis.</p> <p>Should any roads or trails be congressionally designated as part of the NHT system, they would be managed according to the prescriptions set forth in the National Historic Trails section.</p>
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		<p>environment (e.g. wind farms, gas plants, and power plants) within zero to five miles on each side of intact segments of the road or trail unless the project and its associated impacts are not visible from the road or trail.</p> <p>Should any roads or trails be congressionally designated as part of the NHT system, they would be managed according to the prescriptions set forth in the National Historic Trails section.</p> <p>Various Expansion Era (i.e., 1870-1940) roads would be managed according to their historical context. Era roads are those routes developed after establishment of the Transcontinental Railroad in Wyoming in 1869. Management prescriptions similar to those in the Oregon/Mormon Pioneer National Historic Trails Management Plan would be applied, although the ¼ mile protective setback might not always be applied.</p> <p>Management actions would include development of activity plans with the objective of preserving the historical integrity of significant NRHP contributing segments. Activity plans may include NRHP</p>	<p>similar to those in the Oregon/Mormon Pioneer National Historic Trails Management Plan would be applied, although the ¼ mile protective setback might not always be applied.</p> <p>Management actions would include development of activity plans with the objective of preserving the historical integrity of significant NRHP contributing segments. Activity plans may include NRHP nomination of those Expansion Era trails that qualify.</p>	
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		nomination of those Expansion Era trails that qualify.		
<b>Management #</b>	7021			
<b>Protected Resource</b>	Historic roads and trails that are eligible for the NRHP but not congressionally designated.			
<b>RMP Affected Area</b>	Map 2-8			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	None	None	None	CSU
<b>Action Text</b>	No similar action	No similar action	No similar action	<p>Manage the Overland and Cherokee Trails to preserve the trail values, characteristics and settings for which the trail was identified for study.</p> <p>Actions within ¼ mile of contributing trail segments:</p> <p>CSU for fluid minerals.</p> <p>Closed to Oil Shale.</p> <p>Designate as a ROW avoidance area.</p> <p>Petition to segregate and withdraw from locatable mineral entry.</p> <p>Open to solid leasable minerals by subsurface methods only.</p> <p>For most projects, the viewshed will be considered out to three-miles to either</p>

				<p>side of contributing portions of trail.</p> <p>Allow, on a case-by-case basis, highly visible projects and/or projects out of scale with the surrounding environment (e.g. wind farms, gas plants, large transmissionlines, and power plants) withinfive-miles of the trail only if theproject causes no more than aweak contrast to the setting ofthe Overland or Cherokee Trails.</p> <p>Apply the National Historic Trails prescriptions (see National Historic Trails subsection) should any historic road or trail be designated as part of the National Historic Trail System.</p>

<b>Management #</b>	7203
<b>Protected Resource</b>	Wild and Scenic Rivers

RMP Affected Area		Map 2-32		
Alternative	A	B	C	D
<b>Stipulation</b>	Closed	Closed	None	CSU
<b>Action Text</b>	<p>Wild Classification</p> <p>The public lands are closed to mineral leasing and related exploration and development activities. Existing mineral leases on these lands would be allowed to expire.</p>	<p>Designate ½ mile of either side of the river bank an exclusion area for ROWs and surface disturbing activities (except for the purpose of maintaining or enhancing the wild and scenic rivers). Close ½ mile of either side of the river bank to mineral leasing and related exploration and development activities, petition to segregate and pursue a withdrawal from locatable mineral entry, and close to mineral material sales. Retain the existing withdrawal.</p>	<p>No similar action, the Sweetwater River designation would not be retained.</p> <p>Revoke the existing withdrawal for the wild portion of the Sweetwater River.</p>	<p>All Classifications</p> <p>Within ½ mile of either side of the river bank:</p> <p>Designate as a ROW exclusion area.</p> <p>Manage surface disturbing activities to maintain the wild and scenic rivers.</p> <p>CSU for fluid minerals.</p> <p>Close to mineral material sales.</p> <p>Retain the existing withdrawal from mineral location.</p>
<b>Stipulation Description</b>	<b>Stipulation:</b> None	<b>Stipulation:</b> None	<b>Stipulation:</b> None	<p><b>Stipulation:</b> No surface disturbing activities ½ mile of either side of river bank, unless operator can provide a plan to the Authorized Officer that protects the wild and scenic values of the river.</p> <p><b>Purpose:</b> To protect the wild and scenic values of the rivers.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards.</p>

				<p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area is not within the Wild and Scenic Rivers area. This determination shall be based upon BLM evaluation or environmental record of review.</p>
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<b>Management #</b>	7307			
<b>Protected Resource</b>	Red Desert Watershed Management Area.			
<b>RMP Affected Area</b>	Map 2-30			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	Closed	CSU	None	CSU
<b>Action Text</b>	Surface disturbing activities, mineral exploration and development, and seismic activities would continue where acceptable subject to the	Surface disturbing activities, mineral exploration and development, and seismic	No similar action, the Red Desert Watershed Management Area would not be retained.	Allow surface disturbing activities subject to mitigation to minimize impacts. CSU for fluid minerals.

	<p>management guidelines provided in the Minerals section. Approximately 2,500 acres are closed to surface disturbing activities to protect Special Status plant species and to protect relevant and important resource values in the Oregon Buttes ACEC.</p>	<p>activities could be authorized if impacts could be mitigated.</p>		<p>Open approximately 2,860 acres of federal coal lands with development potential in the area to consideration of sub-surface coal leasing and development only.</p>
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Surface disturbing activities would be allowed if operator can provide Authorized Officer with a plan that mitigate impacts to area.</p> <p><b>Purpose:</b> To protect the Special Status plant species and to protect values in the Red Desert Watershed Management Area.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Same as B.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area is not within the Red Desert Watershed Management Area. This determination shall be based upon BLM evaluation or environmental record of review.</p>

<b>Management #</b>	7313			
<b>Protected Resource</b>	Pine Mountain Management Area.			
<b>RMP Affected Area</b>	Map 2-8			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	None	None	None	CSU
<b>Action Text</b>	The Pine Mountain area would be managed as an avoidance area for ROW and surface disturbing activities.	Manage the Salt Wells portion (249,326 acres; Map 2-30) as an exclusion area for ROW and surface disturbing activities, unless the purpose of the activity is to benefit the resource objectives for the management area.  Complete a transportation plan prior to authorization of any new roads or development. Apply a “no net gain in roads” in crucial habitats and consider a seasonal road closure.	Open the Pine Mountain area to ROW and surface disturbing activities.	Avoid surface disturbing activities.  1) Designate as a ROW avoidance area. 2) CSU for fluid mineral leasing.
<b>Stipulation Description</b>	<b>Stipulation:</b> None	<b>Stipulation:</b> None	<b>Stipulation:</b> None	<b>Stipulation:</b> Restrict surface disturbing activities in the Pine Mountain Management Area unless the operator can provide a plan to the AO that shows that the impacts from the proposed action are acceptable and can be adequately mitigated.



				<p><b>Purpose:</b> To protect the resource values of the Pine Mountain Management Area.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>
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<b>Management #</b>	7314
<b>Protected Resource</b>	Unique resources.

RMP Affected Area	Pine Mountain Management Area.			
Alternative	A	B	C	D
Stipulation	CSU	Closed	None	None
Action Text	The area is open to mineral leasing and related exploration and development activities with appropriate mitigation requirements (controlled surface use) applied to protect all other resource values.	Close the area for mineral leasing and geophysical activities.	The area would not be managed as the Pine Mountain Management Area and would not be combined with the Salt Wells area, and the Salt Wells area would not be designated as part of the Greater Red Creek ACEC.	No similar action (see management action 0013 for application of mitigation measures).
Stipulation Description	<p><b>Stipulation:</b> Restrict surface disturbing activities in the Pine Mountain Management Area unless the operator can provide a plan to the AO that shows that the impacts from the proposed action are acceptable and can be adequately mitigated.</p> <p><b>Purpose:</b> To protect the resource values of the Pine Mountain Management Area.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> None</p>

	<p>environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>			
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<b>Management #</b>	7325			
<b>Protected Resource</b>	Four J Basin Portion of the Pine Mountain Management Area.			
<b>RMP Affected Area</b>	Map 2-5			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	NSO	CSU	None	None
<b>Action Text</b>	To meet management objectives, surface occupancy and surface disturbance on BLM-administered public lands would be severely limited or prohibited. No surface occupancy is allowed on the escarpment or toe slopes. Due	Manage the Four J Basin portion as an exclusion area for ROW and surface disturbing activities, unless the purpose of the activity is to benefit the resource objectives for the management area.	No similar action, the area would not be managed as the Pine Mountain Management Area.	No similar action

	to the highly erosive nature of these soils, all surface disturbing activities should be designed for zero runoff into the established drainages.	Complete a transportation plan prior to authorization of any new roads or development. Apply “no net gain in roads” in crucial habitats. Transportation planning would include consideration of seasonal road closures.		
<b>Stipulation Description</b>	<p><b>Stipulation: NSO:</b> Prohibit surface occupancy or use on the escarpment and toe slopes of the Four J Basin.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None <b>Waiver:</b> None</p> <p><b>CSU:</b> Restrict surface disturbing activities the Four J Basin Portion of the Pine Mountain Management Area unless the operator can provide a plan to the AO that shows that the impacts from the proposed action are acceptable and can be adequately mitigated.</p> <p><b>Purpose:</b> To protect the resource values of the Four J Basin Portion of the Pine Mountain Management Area.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p>	<p><b>Stipulation: CSU:</b> Restrict surface disturbing activities the Four J Basin Portion of the Pine Mountain Management Area unless the operator can provide a plan to the AO that shows that the impacts from the proposed action are acceptable and can be adequately mitigated.</p> <p><b>Purpose:</b> To protect the resource values of the Four J Basin Portion of the Pine Mountain Management Area.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None <b>Waiver:</b> None</p>	<b>Stipulation:</b> None	<b>Stipulation:</b> None

	<p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>			
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<b>Management #</b>	7331			
<b>Protected Resource</b>	Sugarloaf Basin.			
<b>RMP Affected Area</b>	Map 2-5			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	CSU	Closed	None	CSU
<b>Action Text</b>	The area is open to mineral leasing and related exploration and development activities with appropriate mitigation requirements applied to	Close the Sugarloaf Basin portion for mineral leasing and geophysical activities.	No similar action, the area would not be designated as an ACEC.	Allow surface disturbing activities if the operator and the BLM arrive at an acceptable plan for avoidance, minimization, rectification, and/or restoration within the

	<p>protect all other resource values.</p>			<p>Sugarloaf Basin area. The purpose of the plan is to ensure that fluid mineral development activities are pursued in a manner that maintain habitat function and result in no significant declines in species distribution or abundance. The BLM will consult with the WGFD to evaluate the adequacy of the conservation plan prior to finalization.</p>
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> Restrict surface disturbing activities in the Sugarloaf Basin unless the operator can provide a plan to the AO that shows that the impacts from the proposed action are acceptable and can be adequately mitigated.</p> <p><b>Purpose:</b> To protect the resource values of the Sugarloaf Basin.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Restrict surface disturbing activities unless the operator and BLM arrive at an acceptable conservation plan for avoidance, minimization, rectification and/or restoration which is required prior to the approval for surface occupancy or use within the Sugarloaf Basin area. The purpose of the plan is to ensure that development activities are completed in a manner that is compatible with maintaining sensitive resources that occur within the area.</p> <p><b>Purpose:</b> To protect sensitive resources to ensure that development activities don't affect their functionality.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet</p>

	<p>identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>			<p>the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>
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<b>Management #</b>	7333			
<b>Protected Resource</b>	Sugarloaf Basin.			
<b>RMP Affected Area</b>	Map 2-5			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	CSU	CSU	None	CSU

<p><b>Action Text</b></p>	<p>Management of habitat or Special Status species, if identified, would be developed on a case-by-case basis.</p> <p>Restrictions for protection of raptors, big game crucial winter range, and big game calving/fawning areas would apply (see Wildlife section and Appendix J). Exceptions to this restriction may be approved if conditions and criteria described in Appendix B.</p>	<p>Manage sensitive wildlife habitats for no-net-loss of habitat and to retain habitat function by applying surface use restrictions. Do not grant exceptions unless they benefit resource values.</p>	<p>No similar action, the area would not be designated as an ACEC.</p>	<p>Manage sensitive wildlife habitats for no-net-loss of habitat and to retain sensitive wildlife habitat function.</p> <p>Allow surface disturbing and disruptive activities subject to adequate mitigation of impacts following BLM mitigation policies or to benefit wildlife resource values.</p>
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> Restrict surface disturbing activities in the Sugarloaf Basin unless the operator can provide a plan to the AO that shows that the impacts from the proposed action are acceptable and can be adequately mitigated.</p> <p><b>Purpose:</b> To protect the resource values of the Sugarloaf Basin.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review.</p>	<p><b>Stipulation:</b> Restrict surface disturbing activities in the Sugarloaf Basin unless the operator can provide a plan to the AO that shows that the impacts from the proposed action are acceptable and can be adequately mitigated and provide for a no-net-loss of habitat.</p> <p><b>Purpose:</b> To protect the resource values of the Sugarloaf Basin.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Restrict surface disturbing activities in the Sugarloaf Basin unless the operator can provide a plan to the AO that shows that the impacts from the proposed action are acceptable and can be adequately mitigated and provide for a no-net-loss of habitat.</p> <p><b>Purpose:</b> To protect the resource values of the Sugarloaf Basin.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a</p>



	<p>The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>			<p>BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>
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<b>Management #</b>	7337			
<b>Protected Resource</b>	The Pinnacles Geographic Area.			
<b>RMP Affected Area</b>	8,950 acres			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	Closed	NSO	None	None
<b>Action Text</b>	<p><u>Leasable Fluid Minerals:</u> The Pinnacles Geographic Area is entirely within Area 3 which is closed to fluid minerals leasing consideration. A portion along the perimeter of the Pinnacles Geographic Area would be</p>	<p>Manage as: (1) closed to mineral material sales/disposal; (2) exclusion area for ROW.</p> <p>Pursue withdrawal from mineral location.</p>	<p>No similar action, the Pinnacles Geographic Area would not be designated as an ACEC.</p>	<p>No similar action</p>

	considered for leasing with an NSO stipulation (approximately 1,200 acres).	Limit surface disturbing activities to actions that would preserve or enhance the values of the area.		
<b>Stipulation Description</b>	<b>Stipulation:</b> None	<b>Stipulation:</b> Prohibit surface occupancy and use in the Pinnacles Geologic Area. <b>Purpose:</b> To protect the resource values of the Pinnacles Geologic Area. <b>Exception:</b> None <b>Modification:</b> None <b>Waiver:</b> None	<b>Stipulation:</b> None	<b>Stipulation:</b> None

<b>Management #</b>	7338			
<b>Protected Resource</b>	Pinnacles Geologic Feature.			
<b>RMP Affected Area</b>	1,345 acres			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	NSO	None	None	NSO
<b>Action Text</b>	The Pinnacles Geologic Feature (approximately 1,345 acres of BLM-administered public land) would continue to be managed as part of the Red Desert Watershed Management Area. The Pinnacles Geologic Feature is entirely within the Pinnacles Geographic Area and contains	Manage the Pinnacles Geologic Feature as a portion of the Pinnacles ACEC (Table 2-12 and Map 2-30).	Open the Pinnacles Geologic Feature to ROW and surface disturbing activities.	The Pinnacles Geologic Feature would not be designated as an ACEC. Management for the Pinnacles Geologic Feature would be as follows: <ul style="list-style-type: none"> <li>• Prohibit surface disturbance</li> <li>• NSO for fluid minerals</li> </ul>

	<p>the actual Pinnacle monoliths, identified as the Pinnacles Proper (about 600 acres) (Table 2-12 and Map 2-29).</p> <p>The Pinnacles Geologic Feature (about 1,345 acres) will be an exclusion area for ROW. Surface use will also be controlled. The use of explosives on and within ½ mile of the Pinnacles Geologic Feature will be prohibited. The VRM classification for the Pinnacles Geologic Feature will be Class II. Vehicular travel within ½ mile of the Pinnacles Geologic Feature, and including the features, will be limited to designated roads and trails. The Pinnacles proper will be closed to surface disturbance.</p>			<ul style="list-style-type: none"> <li>• Petition to segregate and pursue a withdrawal from mineral location</li> <li>• Close to mineral material sales</li> <li>• Designate as a ROW exclusion area</li> <li>• Prohibit the use of explosives on and within ½ mile of the feature</li> <li>• Designate as VRM Class II.</li> </ul>
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> Prohibit surface occupancy and use in the Pinnacles Geologic Feature.</p> <p><b>Purpose:</b> To protect the resource values of the Pinnacles Geologic Feature.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Same as A</p>

<p><b>Management #</b></p>	<p>7341</p>
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<b>Protected Resource</b>	Monument Valley Management Area.			
<b>RMP Affected Area</b>	Map 2-5			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	CSU	Closed	None	None
<b>Action Text</b>	The area is open to: (1) consideration for mineral leasing, exploration, and development provided mitigation can be applied to retain the resource values; (2) consideration for mineral material sales with the appropriate constraints applied to all surface disturbing activities; (3) development and public use with necessary consideration for wildlife, raptors, cultural, watershed, and scientific values.	Close federal sections of the area to mineral leasing, exploration, and development, and mineral material sales.  The federal sections would not be available to development.	No similar action, the Monument Valley Management Area would not be retained.	Same as Alternative C
<b>Stipulation Description</b>	<b>Stipulation:</b> Restrict surface disturbing activities in the Monument Valley Management Area unless the operator can provide a plan to the AO that shows that the impacts from the proposed action are acceptable and can be adequately mitigated.  <b>Purpose:</b> To protect the resource values of the Monument Valley Management Area.	<b>Stipulation:</b> None	<b>Stipulation:</b> None	<b>Stipulation:</b> None

	<p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>			
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<b>Management #</b>	7415			
<b>Protected Resource</b>	Rock art sites.			
<b>RMP Affected Area</b>	Map 2-6			
<b>Alternative</b>	A	B	C	D

<b>Stipulation</b>	NSO	NSO	None	None
<b>Action Text</b>	Any activities or ancillary facilities related to either surface or subsurface mining are prohibited on or within a ½ mile radius of rock art site(s). In areas that are more than ½ mile from rock art site(s), seasonal uses and types of placement of surface facilities, activities, etc., related to subsurface mining, would be allowed on a very limited basis.	Manage the Cedar Canyon Petroglyph rock art site and the surrounding viewshed (within three miles) to protect the cultural and historical values.  Prohibit any activities or ancillary facilities related to either surface or subsurface mining, surface disturbing activities, visual intrusions and audible intrusions within these areas.	No similar action, the ACEC would not be retained.	No similar action (see Cultural, Wildlife and Fisheries sections)
<b>Stipulation Description</b>	<b>Stipulation:</b> Prohibit surface occupancy within ½ mile of the rock art sites. <b>Purpose:</b> To protect rock art sites. <b>Exception:</b> None <b>Modification:</b> None <b>Waiver:</b> None	<b>Stipulation:</b> No surface occupancy or use within three miles of the rock art sites. <b>Purpose:</b> To protect rock art sites. <b>Exception:</b> None <b>Modification:</b> None <b>Waiver:</b> None	<b>Stipulation:</b> None	<b>Stipulation:</b> None

<b>Management #</b>	7456 and 7457			
<b>Protected Resource</b>	Boars Tusk Area.			
<b>RMP Affected Area</b>	1400 acres			
<b>Alternative</b>	A	B	C	D

Stipulation	None	None	None	NSO
<p><b>Action Text</b></p>	<p>The Boars Tusk and approximately 1,400 acres of BLM-administered public lands in the surrounding area would be closed to any surface mining activity, but open to consideration of subsurface mining methods. Activities or ancillary facilities related to subsurface mining would be prohibited (Map 2-29 in the Green River RMP, U.S. DOI 1997).</p> <p><b>#7457</b></p> <p>The Boars Tusk area (about 90 acres) is closed to: (1) surface disturbing activities; (2) mineral material sales; (3) use of explosives and blasting.</p>	<p>Designate the Boars Tusk ACEC an exclusion area for ROW. Close the area to mineral location, mineral material sales and leasable minerals. Pursue a withdrawal from entry under land laws and mineral location.</p> <p>Limit surface disturbing activities to actions that would preserve or enhance the values of the area.</p>	<p>No similar action, the Boars Tusk would not be retained as an ACEC.</p>	<p>Prohibit surface disturbing activities within the Boars Tusk Feature (90 acres). NSO for fluid minerals. Designate as a ROW exclusion area. Prohibit geophysical activities such as shothole, blasting, and vibroseis locations within ½ mile from the site Allow geophysical activities outside ½ mile only after a site-specific analysis determines that visual intrusions and adverse effects would not occur. Allow surface disturbing activities outside of the 90-acre site if the project does not adversely affect the cultural and scenic values of the area.</p>
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> NSO: No surface occupancy or use is allowed inside the 90 acres surrounding Boars Tusk. <b>Purpose:</b> To protect the cultural and scenic values of Boars Tusk Area. <b>Exception:</b> None <b>Modification:</b> None <b>Waiver:</b> None</p>

<b>Management #</b>	7466			
<b>Protected Resource</b>	Crucial big game winter ranges, big game birthing areas.			
<b>RMP Affected Area</b>	Map 2-5			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	TLS	TLS	None	None
<b>Action Text</b>	<p>Surface disturbing activities, geophysical activities, and oil and gas exploration and development activities are restricted seasonally on crucial big game winter ranges and big game birthing areas. Exceptions to this restriction may be approved for activities such as oil and gas development, ROW, construction, and range improvement development, if conditions described in Appendix B apply. Once an operation starts (such as oil and gas drilling/completion), it would be allowed to be completed into or through the winter. Decision points for shutdown due to unacceptable winter conditions occur between exploration or development stages, such as pad construction and drilling startup, and between</p>	<p>Restrict surface disturbing activities, geophysical activities, and oil and gas exploration and development activities seasonally on crucial big game winter ranges, big game birthing areas, and winter concentration areas. Grant no exceptions, waivers or modifications.</p>	<p>No similar action, the ACEC would not be retained.</p>	<p>No similar action (covered in the Fish and Wildlife section)</p>



	drilling/completion and production facility installation.			
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> No surface occupancy or use is allowed in big game winter range and big game birthing areas, and winter concentration areas. During timing restrictions based on the area and wildlife species.</p> <p><b>Purpose:</b> To protect big game winter range, big game birthing areas, and winter concentration areas.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire</p>	<p><b>Stipulation:</b> No surface occupancy or use is allowed in big game winter range, big game birthing areas, and winter concentration areas. During timing restrictions based on the area and wildlife species.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> None</p>

	lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.			
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<b>Management #</b>	7478			
<b>Protected Resource</b>	Natural Corrals ACEC.			
<b>RMP Affected Area</b>	Map 2-5			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	NSO	None	None	NSO
<b>Action Text</b>	The entire ACEC is open to consideration of oil and gas leasing with an NSO stipulation.	The ACEC would be closed to consideration of fluid mineral exploration and development.	No similar action, the ACEC would not be retained.	NSO for fluid mineral exploration and development.
<b>Stipulation Description</b>	<p><b>Stipulation:</b> No surface occupancy or use is allowed in the Natural Corrals ACEC.</p> <p><b>Purpose:</b> To protect the resource values of the Natural Corrals ACEC.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> No surface occupancy or use is allowed in the Natural Corrals ACEC.</p> <p><b>Purpose:</b> To protect the resource values of the Natural Corrals ACEC.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to</p>

	<p>the stipulation based upon a BLM evaluation or environmental record of review.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area is not within the ACEC. This determination shall be based upon BLM evaluation or environmental record of review.</p>			<p>the stipulation based upon a BLM evaluation or environmental record of review.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area is not within the ACEC. This determination shall be based upon BLM evaluation or environmental record of review.</p>
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<b>Management #</b>	7492/5199			
<b>Protected Resource</b>	Pine Springs ACEC.			
<b>RMP Affected Area</b>	Map 2-8			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	Closed	Closed	None	NSO
<b>Action Text</b>	<p>The Pine Springs ACEC (6,030 acres) is closed to surface disturbing activities. About 2,000 acres in the area would be closed to exploration and development of locatable minerals and entry under the land laws. Withdrawal from these activities would be pursued. The existing 90-acre withdrawal would be retained. Cultural resource management plans may be written for the site, and interpretive and visitor management efforts may be allowed as necessary. (see</p>	<p>Designate the ACEC an exclusion area for: (1) surface disturbing activities that could adversely affect resource values or preclude meeting ACEC management objectives; (2) ROW.</p> <p>Pursue a withdrawal from mineral location and entry under the U.S. mining laws.</p> <p>Close the area to: (1) mineral material sales for sand, gravel, or other types of construction or building materials; (2) mineral leasing.</p>	<p>Revoke the existing withdrawal, the ACEC would not be retained.</p>	<p>Prohibit surface disturbing activities.</p> <ul style="list-style-type: none"> <li>• NSO for fluid minerals</li> <li>• Retain the withdrawal from mineral location (within 90 acres)</li> <li>• Close to mineral material sales</li> <li>• Designate as a ROW avoidance area.</li> </ul>

	<p>also Pine Springs ACEC, lands and Realty management and Minerals management discussions). (Surface disturbing activities may include activities associated with mineral exploration and development; construction of roads, pipelines, powerlines; mineral material sales; etc.).</p>	<p>Retain and petition to extend the withdrawal when it expires. Write cultural resource management plans for the site. Allow interpretive and visitor management efforts as necessary.</p>		
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Prohibit surface occupancy or use in the Twin Buttes ACEC. <b>Purpose:</b> To protect the Native American and cultural resource values of the Pine Springs ACEC. <b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet the performance standards above. <b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p>

				<p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>
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<b>Management #</b>	7502			
<b>Protected Resource</b>	South Pass Historic Landscape ACEC.			
<b>RMP Affected Area</b>	Map 2-5			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	CSU	None	None	CSU
<b>Action Text</b>	<p>The landscape is open to consideration of mineral leasing and mineral material sales, provided that effects to the visual and cultural resource values could be mitigated.</p>	<p>Designate the ACEC an exclusion area for ROW and surface disturbing activities (Table 2-12; Map 2-30). Pursue a withdrawal from entry under land laws and mineral location. Close the area to leasable minerals and mineral material sales. Existing fluid mineral leases would not be offered for lease once they expire.</p>	<p>No similar action, the ACEC would not be retained.</p>	<p>The portion of the ACEC that is visible from the NHT and NST: Allow surface occupancy and disturbance only if the project causes no more than a weak contrast to the setting of the trails and does not cause an adverse effect to the trails, NHL, or ACEC values. CSU for fluid minerals.</p>
<b>Stipulation Description</b>	<p><b>Stipulation:</b> Restrict surface disturbing activities unless the effects to the visual and</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Restrict surface disturbing activities within the South Pass Historic Landscape ACEC if the project is visible and will cause an adverse</p>

	<p>cultural resource values could be mitigated.</p> <p><b>Purpose:</b> To protect the visual and cultural effects of the South Pass Historic Landscape ACEC.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease is not within the ACEC. This determination shall be based upon BLM evaluation or environmental record of review.</p>			<p>effect or cause more than a weak contrast to the setting of the NHT.</p> <p><b>Purpose:</b> To protect the National Historic Trails and their setting.</p> <p><b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area is not within the ACEC. This determination shall be based upon BLM evaluation or environmental record of review.</p>
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<b>Management #</b>	7510			
<b>Protected Resource</b>	Special Status Plant Species ACEC.			
<b>RMP Affected Area</b>	Map 2-6			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	Closed	NSO	None	NSO

<p><b>Action Text</b></p>	<p>The ACEC is closed to: (1) direct surface disturbing activities or any disrupting activities (e.g., off-site dust, airpollutants, etc.) that could adversely affect the Special Status plant species and their habitat; (2) the location of mining claims (withdrawal from mineral location and entry under the land laws would be pursued); (3) surfaceoccupancy and surface disturbing activities (such as leasable mineral exploration and development activities or construction of long-term placement of facilities or structures); (4) mineral material sales; (5) the use of explosives and blasting (see Map 2-29).</p>	<p>Designate the ACEC an exclusion area for direct surface disturbing activities orany disrupting activities (e.g., off-site dust, air pollutants, etc.) that could adversely affect the Special Status plantspecies and their habitat. Pursue a withdrawal from mineral location and entry under the land laws. Stipulate no surface occupancy and surface disturbing activities forleasable mineral exploration and development activities or construction of long-term placement of facilities or structures. Close to mineral material sales and use of explosives and blasting.  Retain existing withdrawals for the following plant species: Small rockcress, (<i>Arabis pusilla</i>) (1,020 acres) and Uinta greenthread (<i>Thelesperma pubescens</i>) (3,646 acres).</p>	<p>No similar action, the ACEC would not be retained.</p>	<p>Prohibit surface disturbing activities.  1) NSO for fluid minerals 2) Segregate and pursue a withdrawal from locatable mineral entry 3) Close to mineral material sales 4) Close to solid mineral leasing 5) Designate as a ROW exclusion area 6) Prohibit the use of explosives and blasting 7) Retain existing withdrawals for the following plant species: Small rockcress (<i>Arabis pusilla</i>) (1,020 acres) and Uinta greenthread, (<i>Thelesperma pubescens</i>)(3,646 acres).</p>
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> No surface occupancy within the Special Status Plant Species ACEC.  <b>Purpose:</b> To protect Special Status plants from activities that could adversely the plantsor their habitat.  <b>Exception:</b> None  <b>Modification:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Prohibit surface occupancy and use within the Special Status Plant Species ACEC.  <b>Purpose:</b> To protect Special Status plants from activities that could adversely affect theplants or their habitat.  <b>Exception:</b> The BLM AO may grant an exception if it is</p>

		<b>Waiver:</b> None		<p>determined that the action will not result in a failure to meet the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>
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<b>Management #</b>	7519			
<b>Protected Resource</b>	Steamboat Mountain ACEC.			
<b>RMP Affected Area</b>	Map 2-6			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	None	NSO	None	CSU



<p><b>Action Text</b></p>	<p>The ACEC is closed to mineral material sales.</p>	<p>Designate the ACEC an exclusion area for direct surface disturbing activities or any disrupting activities (e.g., off-site dust, air pollutants, etc.) that could adversely affect the Special Status plantspecies and their habitat. Pursue a withdrawal from mineral location and entry under the land laws. Stipulate no surface occupancy and surface disturbing activities forleasable mineral exploration and development activities or construction of long-term placement of facilities or structures. Close to mineral material sales and use of explosives and blasting.</p>	<p>No similar action, the ACEC would not be retained.</p>	<p>Allow surface disturbing activities subject to mitigationto minimize impacts. CSU for fluid minerals.</p>
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> No surface disturbing activities are allowed that could adversely affect the Special Status plantspecies and their habitat. <b>Purpose:</b> To protect the Special Status plant species inthe Steamboat Mountain ACEC. <b>Exception:</b> None <b>Modification:</b> None<b>Waiver:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Restrict surface disturbing activities in the Steamboat Mountain ACEC unless the operator can provide a plan to the AO that shows that the impacts from the proposed action are acceptable and can be adequately mitigated. <b>Purpose:</b> To protect the Special Status plant species inthe Steamboat Mountain ACEC. <b>Exception:</b> The BLM AO may grant an exception if it is determined that the action will not result in a failure to meet</p>

				<p>the performance standards above.</p> <p><b>Modification:</b> The BLM AO may modify the area subject to the stipulation based upon a BLM evaluation or environmental record of review. The stipulation and performance standards identified above may be modified based on monitoring results from similar actions on similar sites or revisions to national or state performance standards.</p> <p><b>Waiver:</b> The BLM AO determines that the entire lease area does not include limited reclamation potential areas. This determination shall be based upon BLM evaluation or environmental record of review.</p>
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<b>Management #</b>	7539			
<b>Protected Resource</b>	South Wind River ACEC.			
<b>RMP Affected Area</b>	Map 2-6			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	None	NSO	None	None

<p><b>Action Text</b></p>	<p>No similar action</p>	<p>Prohibit surface disturbing activities or facilities on or within three-miles of the trail or the Visual Horizon (whichever is closer) of the Continental Divide National Scenic Trail.</p> <p>Prohibit surface disturbing activities or facilities on or within three miles of the trail or the Visual Horizon (whichever is closer) of the Continental Divide Snowmobile trail.</p> <p>Prohibit surface disturbing activities or facilities on or within three-miles of the trail or the Visual Horizon (whichever is closer) of the South Pass Cross Country Ski Trail.</p>	<p>No similar action, the South Wind River ACEC would not be designated.</p>	<p>Same as Alternative C</p>
<p><b>Stipulation Description</b></p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> Prohibit surface occupancy and use within three-miles of the Continental Divide National Scenic trail and the South Pass Cross Country Ski Trail.</p> <p><b>Purpose:</b> To protect scenic trails and associated settings.</p> <p><b>Exception:</b> None</p> <p><b>Modification:</b> None</p> <p><b>Waiver:</b> None</p>	<p><b>Stipulation:</b> None</p>	<p><b>Stipulation:</b> None</p>

<p><b>Management #</b></p>	<p>7559</p>
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<b>Protected Resource</b>	Big Game Migration Corridor			
<b>RMP Affected Area</b>	Map-2-14			
<b>Alternative</b>	A	B	C	D
<b>Stipulation</b>	None	NSO	None	None
<b>Action Text</b>	No similar action	Manage necessary life state wildlife habitats and sensitive species habitats for no-net-lossor habitat and to retain habitat function by applying NSO restrictions within the ACEC. Grant no exceptions unless they benefit resource values.	No similar action, the Big Game Migration Corridor wouldnot be designated as an ACEC.	Same as Alternative C
<b>Stipulation Description</b>	<b>Stipulation:</b> None	<b>Stipulation:</b> No surface disturbing activities are allowed to protect sensitive species habitats for no-net loss or habitat and to retain habitat function. <b>Purpose:</b> To protect sensitive species. <b>Exception:</b> None <b>Modification:</b> None <b>Waiver:</b> None	<b>Stipulation:</b> None	<b>Stipulation:</b> None

## APPENDIX C—AREAS OF CRITICAL ENVIRONMENTAL CONCERN EVALUATION

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### APPENDIX D —AREAS OF CRITICAL ENVIRONMENTAL CONCERN EVALUATION

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## INTRODUCTION

As part of the process for developing the Rock Springs Resource Management Plan (RMP), the Bureau of Land Management (BLM) planning team members reviewed all BLM administered public lands in the planning area to determine if any areas should be considered for designation as areas of critical environmental concern (ACEC) or if any existing ACEC designations should be modified or terminated. Only BLM-administered public lands can be considered for ACEC designation.

ACECs are BLM lands where special management attention is needed to protect important and relevant values. Special management attention refers to management prescriptions developed during preparation of an RMP or amendment expressly to protect the important and relevant values of an area from the potential effects of actions permitted by the RMP, including proposed actions deemed to be in conformance with the terms, conditions, and decisions of the RMP (BLM Manual 1613).

To be eligible for designation as an ACEC, an area must meet the relevance and importance criteria described in 43 Code of Federal Regulations (CFR) 1610.7-2 and BLM Manual 1613. If the relevance and importance criteria are met, an area must be identified as a potential ACEC and considered for designation and management in the resource planning process. Designation is based on whether a potential ACEC requires special management attention in the selected plan alternative.

Relevance and importance are defined as follows:

- **Relevance.** There shall be present a significant historic, cultural, or scenic value; a fish or wildlife resource or other natural system or process; or natural hazard.
- **Importance.** The above described value, resource, system, process, or hazard shall have substantial significance and values. This generally requires qualities of more than local significance and special worth, consequence, meaning, distinctiveness, or cause for concern. A natural hazard can be important if it is a significant threat to life or property.

An area meets the “relevance” criterion if it contains one or more of the following:

- 1) A significant historic, cultural, paleontological, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).
- 2) A fish and wildlife resource (including but not limited to habitat for endangered, sensitive, or threatened species; or habitat essential for maintaining species diversity).
- 3) A natural process or system (including but not limited to endangered, nonsensitive, or threatened plant species; rare, endemic, or relic plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).
- 4) Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

An area meets the “importance” criterion if it further meets one or more of the following:

- 1) Has more than locally significant qualities, which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.
- 2) Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.

- 3) Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of the Federal Land Policy and Management Act (FLPMA).
- 4) Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.
- 5) Poses a significant threat to human life and safety or to property.

This report presents the completed evaluation forms for the nominated ACECs in the planning area. An ACEC that meets both relevance and importance criteria can be included in at least one management alternative analyzed in the RMP and environmental impact statement.

The rationale for designating or not designating ACECs will be provided in the Final Environmental Impact Statement (FEIS).

## C.1 CEDAR CANYON ACEC EVALUATION

<b>Area Considered</b>	<b>Cedar Canyon</b>
<b>General Location</b>	T 22 N R 103 W sec 6, 8, 10, 16 and 18
<b>General Description</b>	Native American rock art panels
<b>Public Land Acres</b>	2,537
<b>Values Considered</b>	Cultural resources: prehistoric rock art sites. Wildlife: raptor nesting and big game crucial winter range.

**History:** This area was reviewed in the Green River RMP and found to meet relevance and importance criteria for cultural, raptor and wildlife values when originally designated as an ACEC. The Green River RMP recommended the designation be retained.

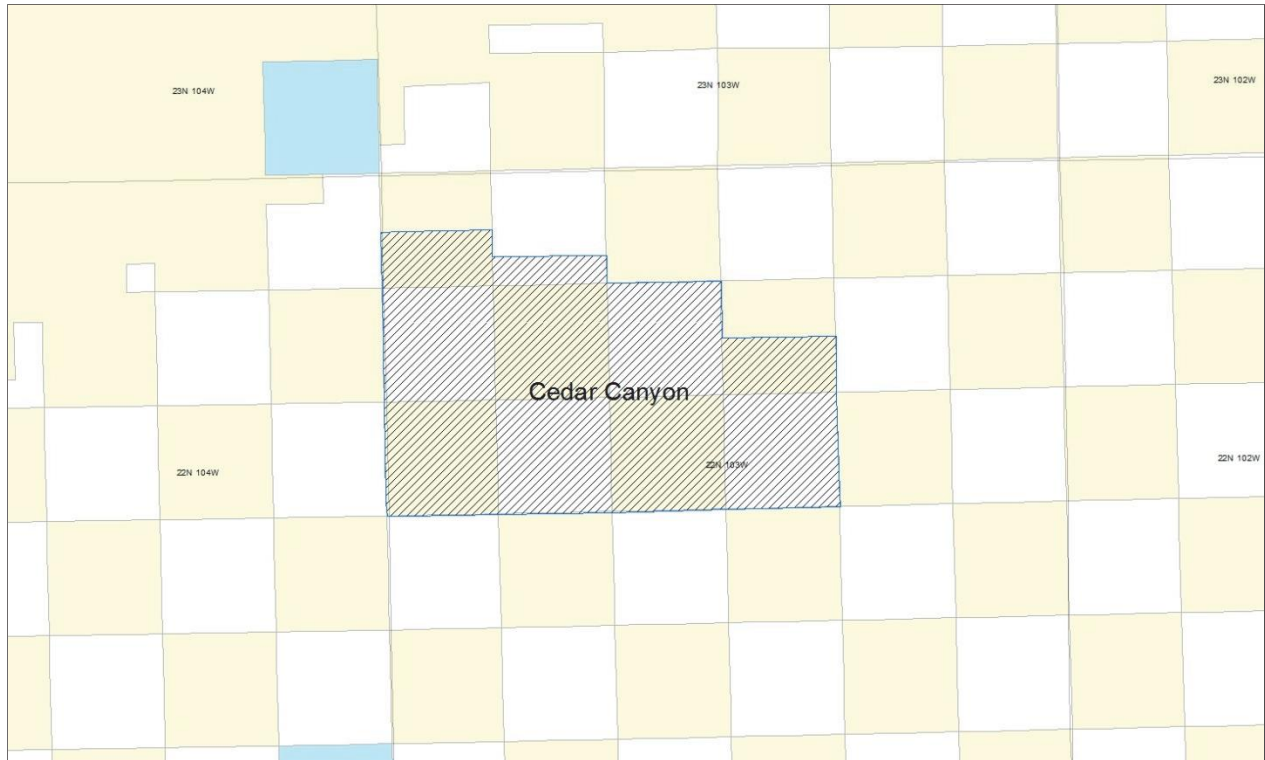
(See Chapter 2 Management Action 7404)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Native American rock art panels	Yes	Culturally significant to the Tribes and to modern local culture.
<b>A fish and wildlife resource:</b> Raptor nesting area Big game crucial winter range	Yes	The area is a known raptor nesting area and is within big game crucial winter range habitat.
<b>A natural process or system:</b>	No	
<b>Natural hazards:</b>	No	
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The area contains some well-developed Native American rock art panels. The area's remote and little-known location has served to protect the area from vandalism common to rock art panels.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The fragile nature of sandstone rock art panels makes this resource extremely vulnerable to vandalism and seismic activity, whether human or naturally caused.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The rock art panels have been recognized as having high cultural significance to the tribes.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	



**Findings:** This nomination meets the relevance and importance criteria for significant historic, cultural and wildlife values and is evaluated for future management actions in the Draft EIS.

**Figure C-1. Map of the Cedar Canyon ACEC**



**Figure C-2. Cedar Canyon Rock Art**



## C.2 GREATER RED CREEK ACEC EVALUATION

### Red Creek Portion of the Greater Red Creek ACEC Evaluation

<b>Area Considered</b>	<b>Red Creek</b>
<b>General Location</b>	The area is located north of the Utah/Wyoming border, approximately 32 miles south of the City of Rock Springs and contains the tributaries to Red Creek.
<b>General Description</b>	This area contains the Red Creek Escarpment and the Red Creek Drainage, in addition to the Red Creek Wilderness Study Area (WSA).
<b>Public Land Acres</b>	55,718
<b>Values Considered</b>	Red Creek Escarpment scenic values. Special Status Species: sage-grouse, raptor nesting habitat, Colorado River cutthroat trout. Big game crucial winter range and parturition habitat. Historic era graves: Bill Pidgeon. Paleontological resources: formations known to yield important reptile and avian fossil specimens.

**History:** The Greater Red Creek ACEC was identified in the Green River RMP as meeting relevance and importance criteria for unstable fragile sensitive soils, unique ecological features, watershed and cultural values, and sensitive species of regional, national, and international importance. The values for the existing Red Creek ACEC remain the same as identified when Red Creek was originally designated an ACEC and was retained in the Green River RMP. It was also expanded to include the Current Creek and Sage Creek portions at that time.

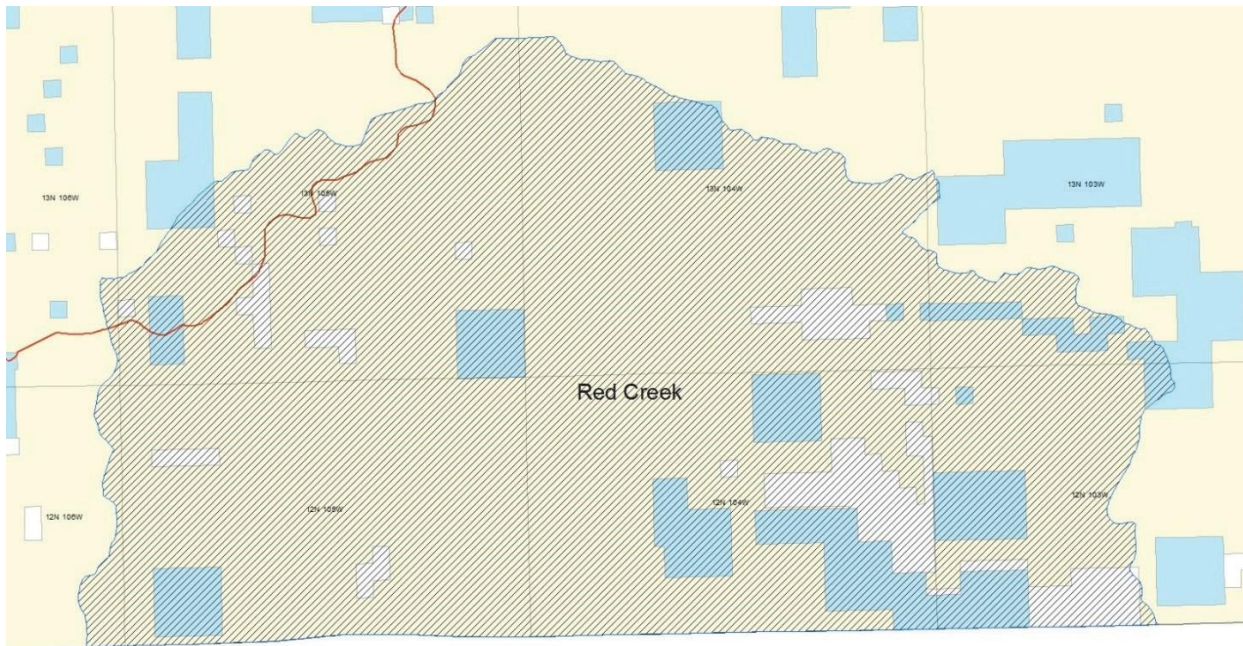
(See Chapter 2 Management Action 7418 & 7439)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Bill Pidgeon's grave Red Creek Escarpment Red Creek WSA	Yes	This area contains the grave of notorious outlaw Bill Pidgeon. It is also a favorite location for scenery photography and scenery painters because of its diverse visual variety. The Red Creek WSA, along with the scenic values of Teepee Mountain, Richards Gap, Minnie's Gap, and the Red Creek Escarpment make this area one of the more impressive scenic vistas in the planning area.
<b>A fish and wildlife resource:</b> Colorado River cutthroat trout Big game crucial winter range Big game parturition	Yes	The area contains significant habitat for the Colorado River cutthroat trout, a BLM sensitive species. It also contains significant big game crucial winter range and parturition habitat.
<b>A natural process or system:</b> Red Creek Escarpment Old growth juniper communities Special Status plant species Paleontological resources	Yes	The area contains the Red Creek Escarpment, a unique geologic feature. This area contains relic plant communities and old growth juniper. It also has surface expressions of formations known to yield important reptile and avian fossil specimens in addition to more common fossil resources.
<b>Natural hazards:</b> Red Creek Escarpment	Yes	Due to the fragile nature of the unstable soils that make up the escarpment, and the highly erodible nature and salt content of soils in the balance of the Red Creek area, the Red Creek drainage is part of the Colorado Salinity Compact.
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for	Yes	The area contains big game crucial winter range and parturition habitat, as well as habitat for the Colorado river cutthroat trout.

concern, especially compared to any similar resource.		
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Due to the fragile nature of the unstable soils that make up the escarpment, and the highly erodible nature and salt content of soils in the balance of the Red Creek area, the Red Creek drainage is part of the Colorado Salinity Compact.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	In addition to special status habitat, the Red Creek drainage is part of the Colorado Salinity Compact. This area contains relic old growth juniper. It also has surface expressions of formations known to yield important reptile and avian fossil specimens in addition to more common paleontological resources.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant historic, cultural, paleontological, wildlife, and scenic values and is evaluated for future management actions in the Draft EIS.

**Figure C-3. Map of Red Creek Portion of the Greater Red Creek ACEC**



### C.3 CURRANT CREEK PORTION OF THE GREATER RED CREEK ACEC EVALUATION

<b>Area Considered</b>	<b>Current Creek</b>
<b>General Location</b>	The Currant Creek drainage basin is located approximately 25 miles south and west of the City of Rock Springs. The area is west of State Highway 191 North, east of Flaming Gorge Reservoir, between Currant Creek Ridge and Big Ridge.
<b>General Description</b>	The area generally contains varying habitats, including riparian along the stream, sagebrush and juniper habitats, and some aspen and pine habitat.
<b>Public Land Acres</b>	23,685
<b>Values Considered</b>	Cultural resources: historic graves and Cherokee Trail. Wildlife: big game crucial winter range, big game parturition habitat, Special Status Species: Colorado River cutthroat trout, sage-grouse priority habitat management areas (PHMA). Paleontological resources.

**History:** The Greater Red Creek ACEC was identified in the Green River RMP as meeting relevance and importance criteria for unstable fragile sensitive soils, unique ecological features, watershed and cultural values, and sensitive species of regional, national, and international importance. The values for the existing Red Creek ACEC remain the same as identified when Red Creek was originally designated an ACEC and was retained in the Green River RMP. It was also expanded to include the Currant Creek and Sage Creek portions at that time.

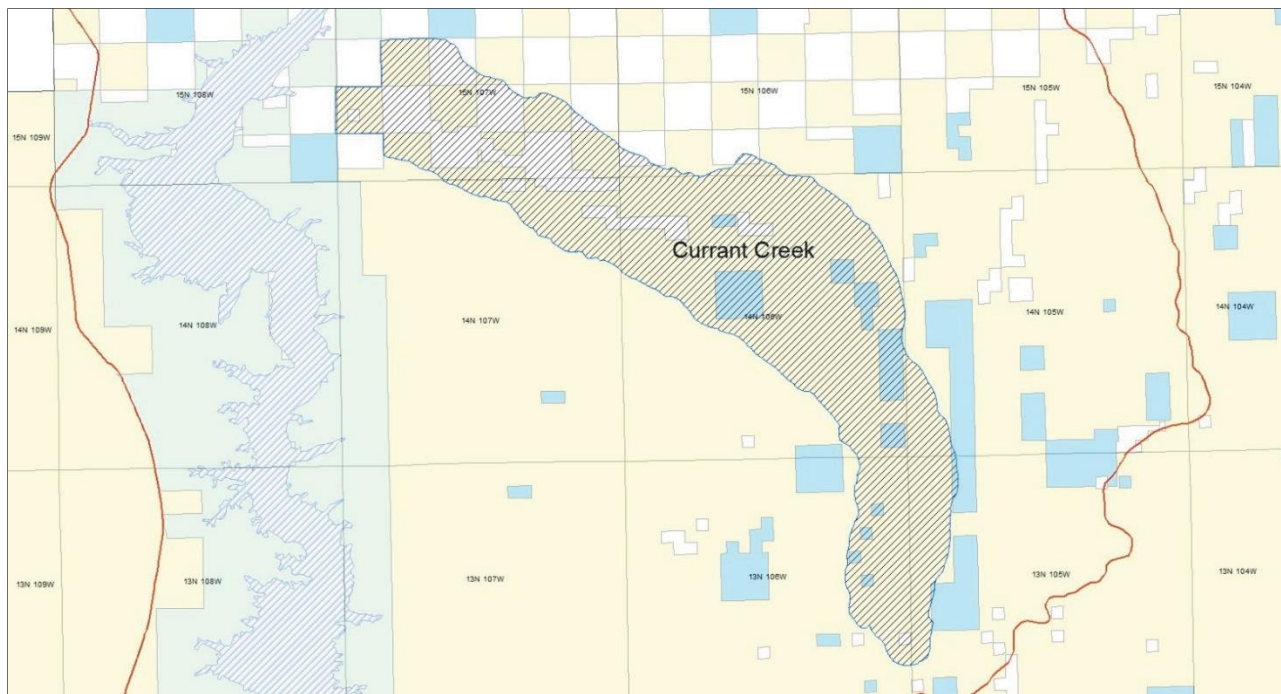
(See Chapter 2 Management Action 7434)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Cherokee Trail	Yes	This area contains intact contributing sections of the Cherokee Trail. It also includes sweeping vistas of the adjacent Flaming Gorge National Recreation Area.
<b>A fish and wildlife resource:</b> Colorado River cutthroat trout Elk and deer crucial habitat Sage-grouse PHMA	Yes	The area contains significant habitat for BLM sensitive species including sage-grouse PHMA and the Colorado River cutthroat trout. It also contains significant big game crucial winter range and parturition habitat.
<b>A natural process or system:</b> Special Status plant species Paleontology resources	Yes	This area contains relic plant communities, old growth juniper, and habitat for the Ownbey's thistle, a BLM sensitive species. It also has surface expressions of formations known to yield important reptile and avian fossil specimens in addition to more common fossil resources.
<b>Natural hazards:</b> Pine bark beetle kill	Yes	Natural hazards include large zones of standing dead timber, which significantly increases the potential for wildfire.
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The area contains Jayne's Meadow, an important area for sensitive species protection. The area has significant habitat for the Colorado River cutthroat trout, a BLM sensitive species. The area also contains the Cherokee Trail which is a candidate to become a designated National Historic Trail.

Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The area contains sage-grouse PHMA, big game crucial winter range and parturition habitat, and contains in-stream structures designed to protect Colorado River cutthroat trout.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The protection of a pure strain of Colorado River cutthroat trout is a national priority in order to sustain the species. The area has sage-grouse PHMA, and intact sections of the Cherokee Trail.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant historic, cultural, paleontological, scenic and wildlife values, and is evaluated for future management actions in the Draft EIS.

**Figure C-4. Map of Currant Creek Portion of the Greater Red Creek ACEC**



## C.4 SAGE CREEK PORTION OF THE GREATER RED CREEK ACEC EVALUATION

<b>Area Considered</b>	<b>Sage Creek</b>
<b>General Location</b>	The Sage Creek drainage is located 20 miles south of the City of Rock Springs, seven miles north of the Utah/Wyoming border, east of Big Ridge, and 18 miles west of U.S. Highway 430.
<b>General Description</b>	This area contains varying habitat types, including sagebrush, juniper, and riparian, and also includes important habitat for a variety of wildlife species. In addition, the area contains scientifically significant fossil resources.
<b>Public Land Acres</b>	52,199
<b>Values Considered</b>	Cultural resources: Cherokee Trail, historic graves, Logan School House, and numerous prehistoric sites. Wildlife: big game crucial winter range and parturition habitat. Special Status Species: Colorado River cutthroat trout, sage-grouse PHMA. Paleontological resources: important reptile and avian fossil specimens.

**History:** The Greater Red Creek ACEC was identified in the Green River RMP as meeting relevance and importance criteria for unstable fragile sensitive soils, unique ecological features, watershed and cultural values and sensitive species of regional, national, and international importance. The values for the existing Red Creek ACEC remain the same as identified when Red Creek was originally designated an ACEC and was retained in the Green River RMP. It was also expanded to include the Current Creek and Sage Creek portions at that time.

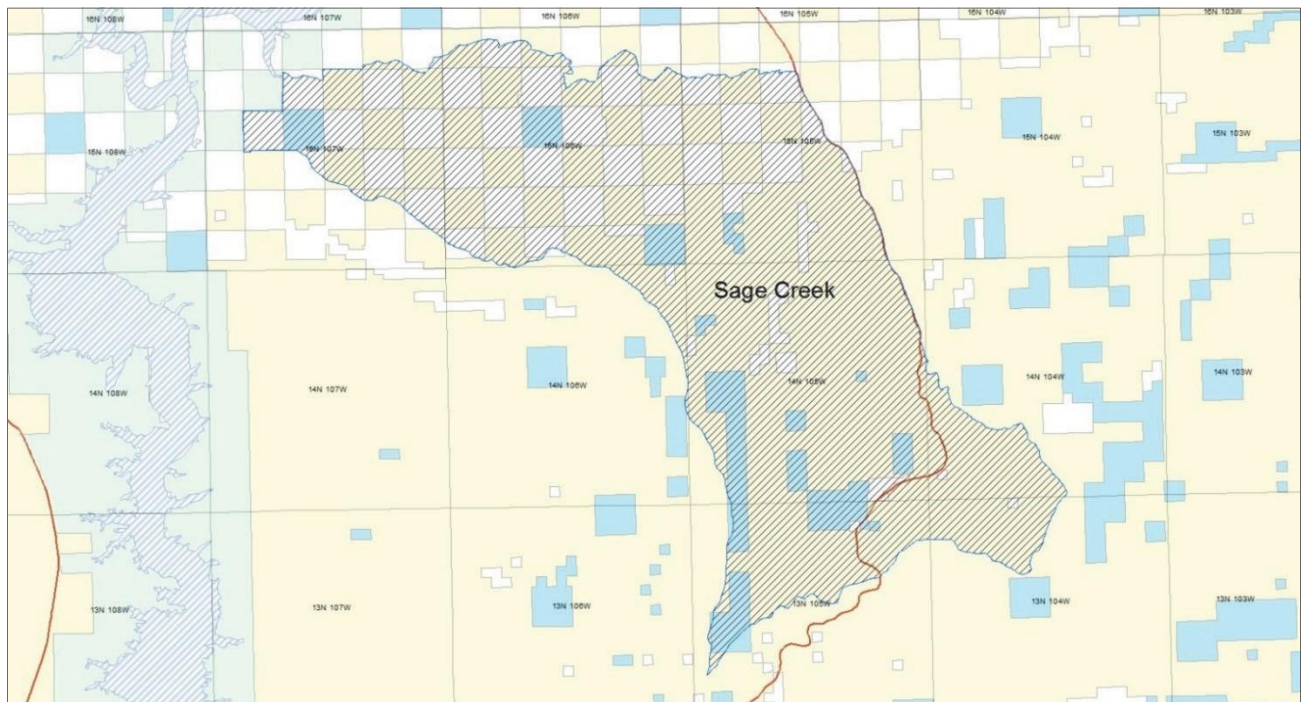
(See Chapter 2 Management Action 7431)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Melinda Armstrong's Grave Surveyor Grave (Mike Gibbons) Cherokee Trail Logan School House	Yes	This area contains two identified human graves, one belonging to pioneer woman Melinda Armstrong who is buried beside the Cherokee Trail. The trail through this area contains some of the best expressions of intact setting along the Cherokee Trail found in the planning area. The other grave is Mike Gibbons, a surveyor who died on the job and was buried here. In addition, the historic Logan School House still stands where it was built to educate children from the surrounding ranches.
<b>A fish and wildlife resource:</b> Colorado River cutthroat trout Sage-grouse PHMA Big game crucial winter range Big game parturition	Yes	The area contains big game crucial winter range and parturition habitat. It is also contains sage-grouse PHMA and habitat for the Colorado River cutthroat trout.
<b>A natural process or system:</b> Relic plant communities Fossil assemblages	Yes	The area contains some of the oldest old-growth juniper in the planning area. It also contains habitat for the Ownbey's thistle, a BLM sensitive species. It has surface expressions of formations known to yield important reptile and avian fossil specimens in addition to more common fossil resources.
<b>Natural hazards:</b> Greater than 25% slopes Numerous springs Occurrence of natural cause wildfire	Yes	The area is composed of many slopes that are greater than 25%. When combined with unstable fragile soils and a high occurrence of natural springs, there may be a high probability of landslides. In addition, the area has some of the highest probability for naturally ignited wildfires in the planning area.

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The area contains known human burials, the nationally significant Historic Cherokee Trail, which is a candidate to be designated as a National Historic Trail (NHT), as well as historic structures including the Logan School House. It also contains habitat for Ownbey’s thistle and Colorado River cutthroat trout.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	This area contains fragile soils, sage-grouse PHMA, Colorado River cutthroat trout, and Ownbey’s thistle habitat. It also has historic structures and other cultural/historical sites.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The Sage Creek drainage is part of the Colorado River Salinity Compact area. The inventory unit also contains sage-grouse PHMA, Colorado River cutthroat trout, and Ownbey’s thistle habitat.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	Yes	This area has a higher occurrence for wildfire, which poses a threat to life and property.

**Findings:** This nomination meets the relevance and importance criteria for a significant historic, cultural, paleontological, soils and wildlife values, and is evaluated for future management actions in the Draft EIS.

**Figure C-5. Map of Sage Creek Portion of the Greater Red Creek ACEC**





## C.5 SALT WELLS ACEC EVALUATION

<b>Area Considered</b>	<b>Salt Wells</b>
<b>General Location</b>	The area is 25 miles south of Interstate 80 and bounded by the checkerboard lands. It is west of Adobe Town Rim, east of and directly adjacent to the existing Red Creek ACEC, and north of the Colorado/Wyoming border.
<b>General Description</b>	Salt Wells includes important bird areas along with other important wildlife habitats. It also includes several historic trails.
<b>Public Land Acres</b>	249,326
<b>Values Considered</b>	Cultural: Cherokee and Overland Trails. Paleontological resources: scientifically important paleo-botany fossil assemblages. Wildlife: sage-grouse PHMA, raptor nesting, and big game crucial winter range.

**History:** The Greater Red Creek ACEC was identified in the Green River RMP as meeting relevance and importance criteria for unstable fragile sensitive soils, unique ecological features, watershed and cultural values, and sensitive species of regional, national, and international importance. The values for the existing Red Creek ACEC remain the same as identified when Red Creek was originally designated an ACEC and was retained in the Green River RMP. It was also expanded to include the Current Creek and Sage Creek portions at that time. The Salt Wells and Sugarloaf Basin portions are proposed to be added with this effort.

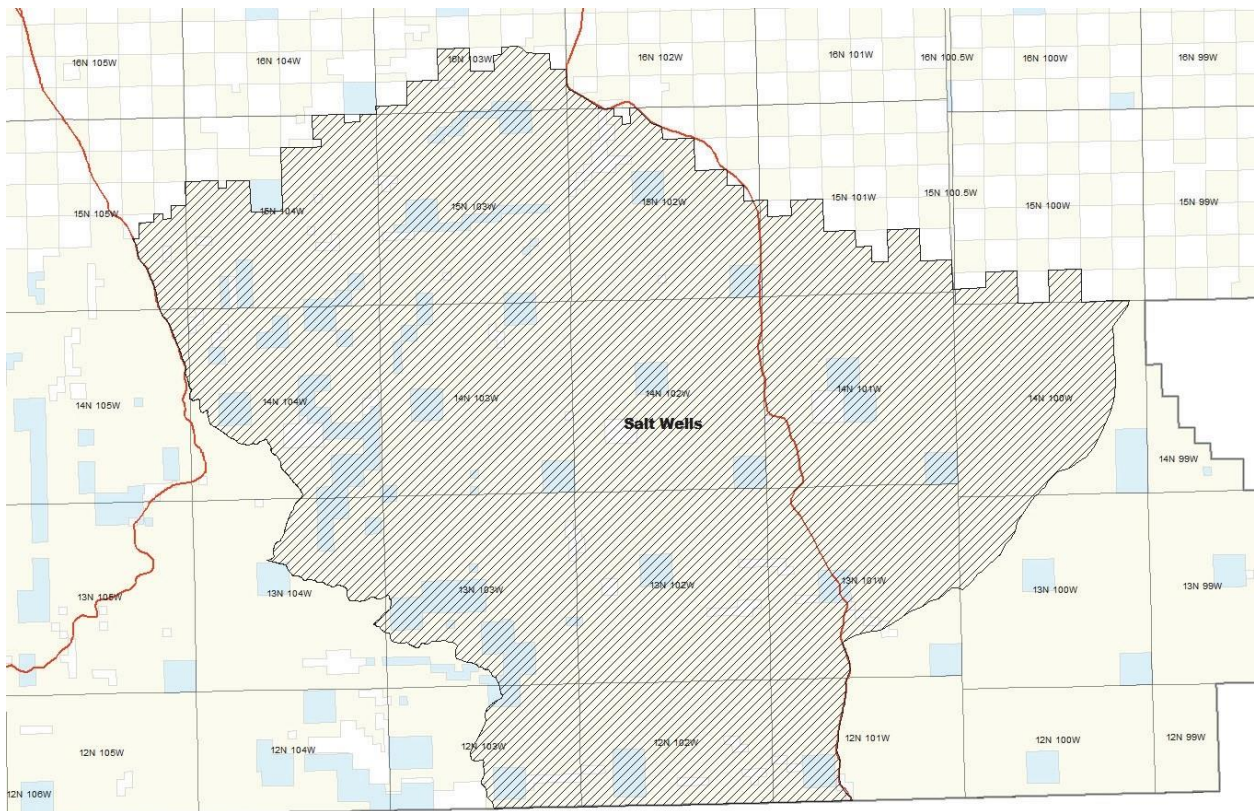
(See Chapter 2 Management Action 7312)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Cherokee and Overland Trail Brown's Park Wagon Road	Yes	The area contains intact contributing sections of the Cherokee Trail and the Pine Butte Variant of the Overland Trail, which are both candidates to be designated as NHTs. Also, the Brown's Park Wagon Road crosses north-south through the area.
<b>A fish and wildlife resource:</b> Raptor nesting area Sage-grouse core Big game crucial habitat	Yes	Pine Mountain and Four J Rim are significant raptor nesting areas. It also contains sage-grouse PHMA and big game crucial winter habitat.
<b>A natural process or system:</b> Old growth juniper Wyoming Department of Environmental Quality (WDEQ) 303D listed stream	Yes	Portions of the Salt Wells area contain some of the oldest juniper communities in the planning area. In addition, the stream is listed with the WDEQ as a 303D stream (threatened or impaired, requiring total maximum daily load).
<b>Natural hazards:</b> Steep cliffs Fragile soils Pine bark beetle killed trees	Yes	The steep cliffs and fragile, highly erodible soil indicate a high landslide potential. In addition, large areas of pine bark beetle infested trees pose a threat from wildfire.
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	Intact sections of the Cherokee Trail and Browns Park Wagon Road cross the area. In addition, the area contains big game crucial winter range, sage-grouse PHMA, and significant raptor nesting habitat.

Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	This area is a type location for scientifically important paleobotany fossil assemblages. It contains sage-grouse PHMA and highly erosive sensitive soils. The area contains intact sections of the Cherokee Trail, Overland Trail and Browns Park Wagon Road.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The area contains sage-grouse PHMA and highly erosive sensitive soils. Intact sections of the Cherokee Trail, Overland Trail and Browns Park Wagon Road cross the area.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant historic, cultural, paleontological, and important wildlife values, and is evaluated for future management actions in the Draft EIS.

**Figure C-6. Map of Salt Wells Area**



## C.6 SUGARLOAF BASIN ACEC EVALUATION

<b>Area Considered</b>	<b>Sugarloaf Basin</b>
<b>General Location</b>	The area is located 30 miles south and west of the City of Rock Springs. It is between the existing Red Creek ACEC and the Flaming Gorge National Recreation Area and north of the Utah/Wyoming border.
<b>General Description</b>	This area contains the Sugarloaf Basin Petroglyphs, as well as habitat for Special Status Species.
<b>Public Land Acres</b>	87,243
<b>Values Considered</b>	Cultural: Sugarloaf Basin rock art site, scenic – Flaming Gorge vistas. Wildlife: big game crucial winter range and parturition habitat. Special Status Species: sage-grouse PHMA, Ownbey's thistle. Paleontology: Middle-Eocene fossil assemblages.

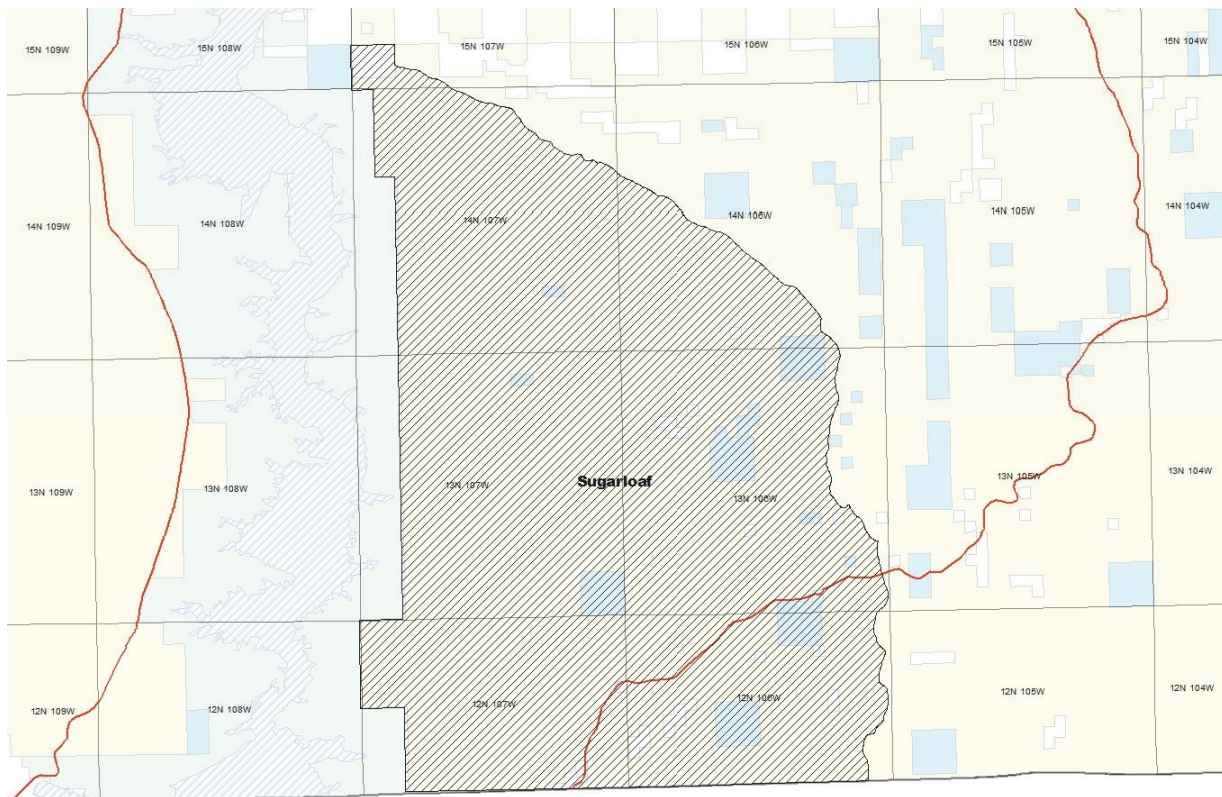
**History:** This is a new ACEC proposal.

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Sugarloaf Petroglyphs Native American religious concerns High scenic values	Yes	This area contains the Sugarloaf Basin Petroglyphs site, which is highly significant to the Tribes. It also contains sweeping vistas of adjacent Flaming Gorge National Recreation Area and includes surface expressions of the Glenwood formation and other high scenic value areas.
<b>A fish and wildlife resource:</b> Midget faded rattlesnake habitat Pygmy rabbit habitat Sage-grouse PHMA Big game crucial winter range Big game parturition	Yes	This area contains habitat for BLM sensitive species, including known populations of midget faded rattlesnakes, pygmy rabbits, and is sage grouse PHMA (see BLM GSG Plans). In addition, it contains big game crucial winter range and parturition habitat.
<b>A natural process or system:</b> Little Mountain Relic pinion-juniper plant communities Type location for Middle-Eocene fossil assemblages	Yes	The area includes the western portion of Little Mountain which has local cultural significance. The area contains relic pinion-juniper plant communities and is also a type-location for Middle-Eocene fossil assemblages.
<b>Natural hazards:</b> Unstable soil Fire	Yes	The area contains highly erosive unstable soils making it more susceptible to landslide. The area also has one of the highest occurrences of naturally caused wildfire in the planning area.
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The area has high significance to Native American Tribes and local culture.

Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	This area contains known locations of BLM sensitive species, including midget faded rattlesnake, pygmy rabbits, and contains sage-grouse PHMA. It also contains a relic pinion-juniper plant community and known locations of Ownbey's thistle.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The area is a sage-grouse PHMA area and contains known locations of Ownbey's thistle, a BLM sensitive plant species. Drainages that feed into Flaming Gorge reservoir are part of the Green River Salinity Compact. It also contains a portion of the West-Wide Energy Corridor.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	Yes	Higher wildfire occurrence poses a threat to human life and property.

**Findings:** This nomination meets the relevance and importance criteria for a significant historic, cultural, paleontological, wildlife and scenic values, and is evaluated for future management actions in the Draft EIS.

**Figure C-7. Map of Sugarloaf Basin Area**



## C.7 GREATER SAND DUNES ACEC EVALUATION

### East portion of the Greater Sand Dunes ACEC Evaluation

<b>Area Considered</b>	<b>Greater Sand Dunes</b>
<b>General Location</b>	The east portion of the Greater Sand Dunes is located 23 miles north and east of the City of Rock Springs, east of the Sand Dunes WSA and west of the Steamboat ACEC.
<b>General Description</b>	This area contains the Killpecker Sand Dunes Open Play Area and the Crookston Homestead cultural site.
<b>Public Land Acres</b>	12,927
<b>Values Considered</b>	Cultural resources: Crookston historic homestead. Recreation resources: Killpecker Sand Dunes Open Play Area. Wildlife: big game crucial winter range, big game parturition, designated Sublette mule deer migration corridor. Special Status Species: sage-grouse PHMA. Plant communities: basin big sagebrush/lemon scurfpea.

**History:** This area was reviewed in the Green River RMP and the Jack Morrow Hills Coordinated Activity Plan (CAP) and found to meet the relevance and importance criteria for outstanding geological features, prehistoric and historic values of national significance, and recreation values of regional and national importance as identified when originally designated an ACEC. The ACEC designation was retained.

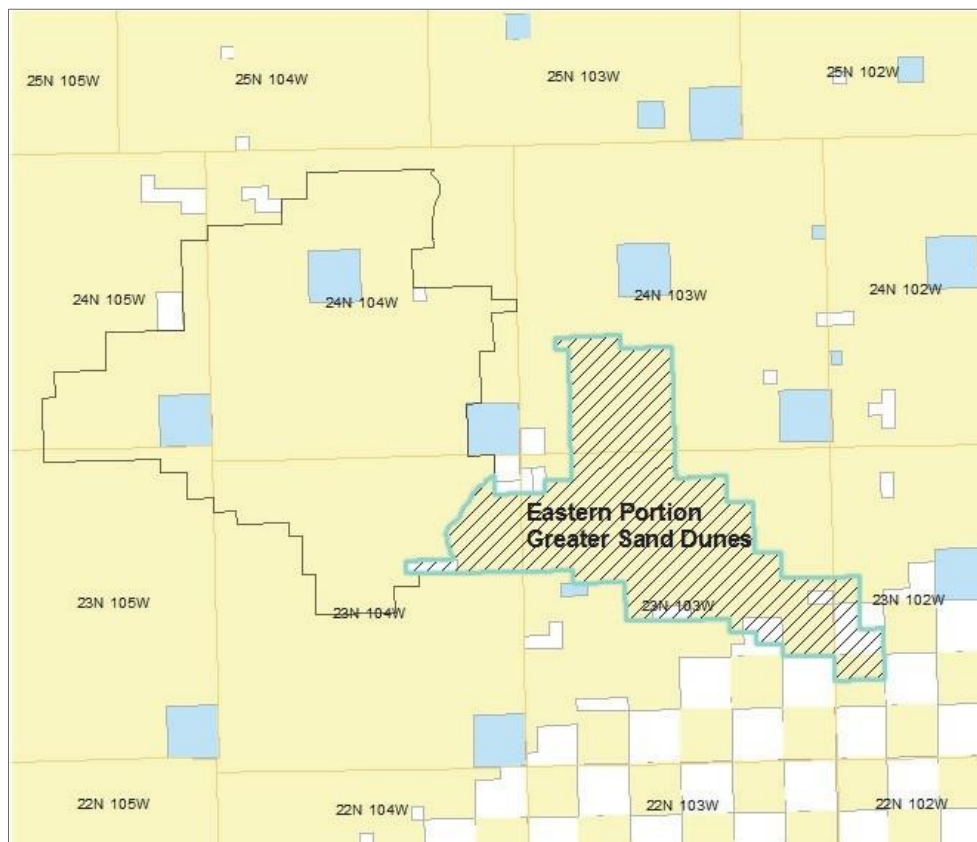
(See Chapter 2 Management Action 7446)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Stabilized sand dunes (cultural sites) Crookston Homestead	Yes	The area has significant stabilized sand dunes which have in the past yielded intact historic and prehistoric information in intact provenience. The historic Crookston Ranch Homestead is also located within the area.
<b>A fish and wildlife resource:</b> Sage-grouse PHMA Big game crucial winter range Big game parturition Flockets	Yes	This area contains a small portion of sage-grouse PHMA. It also includes big game crucial winter range and parturition habitat. These animals use the dunal ponds called "flockets" in the sand dunes as watering locations when water becomes scarce elsewhere.
<b>A natural process or system:</b> Flockets Basin big sage/lemon scurf pea plant community Old growth sage Rare geologic features	Yes	The area includes basin big sagebrush/scurfpea plant communities identified as needing protection. In addition, the area includes known rare geologic features that are unique and fragile, including the sand dunes and flockets.
<b>Natural hazards:</b> Active sand dunes	Yes	The entire area is part of the nationally and internationally significant Greater Sand Dunes dune system.
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The area includes the historic Crookston Ranch Homestead which is part of the Greater Sand Dunes dune system. Portions of the designated Sublette mule deer migration corridor cross through this area.

Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The flocks (interdunal pond areas) and basin big sagebrush/lemon scurfpea communities are both rare, fragile, and irreplaceable.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The historic Crookston Ranch Homestead is eligible for listing on the National Register of Historic Places (NRHP). The Sand Dunes Open Play Area is a nationally known dune riding location due to its remoteness and relatively pristine character. It is a Special Recreation Management Area (SRMA). It also contains a small portion of sage-grouse PHMA, and basin big sagebrush/lemon scurfpea plant communities. Interior Secretarial Order 3362 mandates protections for areas such as the designated Sublette mule deer migration corridor.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	Yes	The stabilized sand dunes are co-located with a working natural gas field. These two uses, while not incompatible, are potentially hazardous to have co-located.
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant historic, cultural, geological, and wildlife values, and is evaluated for future management actions in the Draft EIS.

**Figure C-8. Eastern Portion of the Greater Sand Dunes ACEC**



## C.8 WESTERN PORTION OF THE GREATER SAND DUNES ACEC EVALUATION

<b>Area Considered</b>	<b>Western Greater Sand Dunes</b>
<b>General Location</b>	This area is located 23 miles north and east of the City of Rock Springs. It is east of the West Sand Dunes Archeological District and west of the Killpecker Sand Dunes Open Play Area.
<b>General Description</b>	The Indian Gap and associated Indian Gap Trail are located in this area, as well as important geologic features and known human burials.
<b>Public Land Acres</b>	26,364
<b>Values Considered</b>	Cultural: Boar's Tusk, Indian Gap. Wildlife: big game crucial winter range, big game parturition, designated Sublette mule deer migration corridor. Special Status Species: sage-grouse PHMA. Plant community: basin big sagebrush/lemon scurfpea.

**History:** This area was reviewed in the Green River RMP and the Jack Morrow Hills CAP and found to meet the relevance and importance criteria for outstanding geological features, prehistoric and historic values of national significance, and recreation values of regional and national importance as identified when originally designated an ACEC. The ACEC designation was retained.

(See Chapter 2 Management Action 7446)

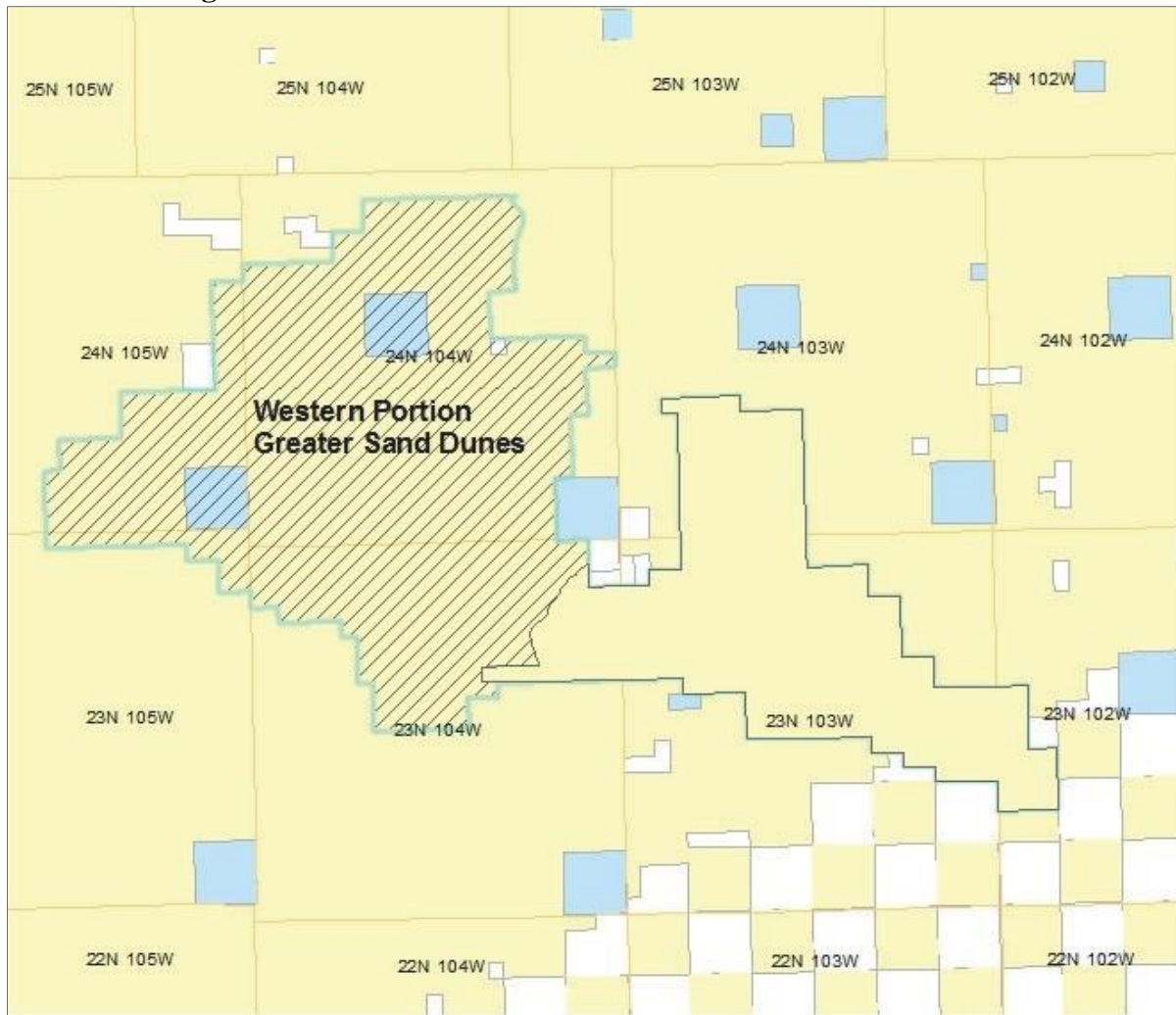
<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Know human burials Boar's Tusk geologic feature Indian Gap Trail	Yes	This area includes the prehistoric Indian Gap Trail and also has locations of known human burials. The Boar's Tusk geologic feature is significant to the Native American Tribes.
<b>A fish and wildlife resource:</b> Sage-grouse PHMA Big game crucial winter range Big game parturition Flockets	Yes	This inventory unit contains portions of sage-grouse PHMA. It also contains big game crucial winter range and parturition habitat. These animals use the dunal ponds called "flockets" in the sand dunes as watering locations when water becomes scarce elsewhere.
<b>A natural process or system:</b> Sand Dunes and Buffalo Hump WSAs Boar's Tusk geologic feature Basin big sagebrush/lemon scurfpea plant community Flockets	Yes	The area contains the Boar's Tusk geologic feature, which meets relevance and importance on its own merits. It also includes portions of the Sand Dunes and Buffalo Hump WSAs. In addition, the area includes the basin big sagebrush/lemon scurfpea plant communities, a rare community identified as needing protection.
<b>Natural hazards:</b> Stabilized sand dunes.	Yes	The vegetated upper layer of these dunes is extremely fragile and once disturbed, the dune becomes an active sand dune and is susceptible to erosion. An active sand dune is extremely difficult to stabilize again.

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The inventory unit contains portions of sage-grouse PHMA. The area also contains significant big game crucial winter range and parturition habitat. In addition, the flocks are individual ecosystems which have not been adequately studied. It also contains basin big sagebrush/lemon scurfpea plant communities.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The inventory unit contains portions of sage-grouse PHMA. The area also contains significant big game crucial winter range and parturition habitat. In addition, the flocks are individual ecosystems which have not been adequately studied. It also contains basin big sagebrush/lemon scurfpea plant communities.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	Known human burials exist in several locations in the area. Boar's Tusk geologic feature is fragile and irreplaceable. In addition, the area includes portions of the Sand Dunes and Buffalo Hump WSAs which require protections under FLPMA. The area also includes basin big sagebrush/lemon scurfpea plant communities.  Interior Secretarial Order 3362 mandates protections for areas such as the designated Sublette mule deer migration corridor.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	Yes	The Boar's Tusk geologic feature is listed as a desirable climbing location in numerous publications despite it being closed to activities that would damage the feature, such as climbing. The base material is delicate and friable.

**Findings:** This nomination meets the relevance and importance criteria for a significant historic, cultural, geological, and scenic values, and is evaluated for future management actions in the Draft EIS.



Figure C-9. Western Portion of the Greater Sand Dunes ACEC



## C.9 BOAR'S TUSK PORTION OF THE GREATER SAND DUNES ACEC EVALUATION

<b>Area Considered</b>	<b>Boar's Tusk</b>
<b>General Location</b>	T 23 N R 104 W sec 16.
<b>General Description</b>	The Boar's Tusk is a unique geological feature. It is a volcanic neck composed of volcanic material intermixed with broken bits of wall-rock. It is similar in age to Devil's Tower and is a known raptor area with existing nests along the various cracks in the surface.
<b>Public Land Acres</b>	500
<b>Values Considered</b>	Cultural: Tribal significance of Boar's Tusk Geologic Feature. Scenic: high visual qualities. Wildlife: raptor nesting habitat.

**History:** Boars Tusk is located within the Greater Sand Dunes ACEC but meets relevance and importance criteria on its own merits. It can be designated as part of the Greater Sand Dunes ACEC or as part of the Boar's Tusk ACEC.

(See Chapter 2 Management Action 7455)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Boar's Tusk burial Culturally significant landmark	Yes	The area surrounding Boar's Tusk contains known Native American burial site and has deep traditional and cultural affiliation with the Tribes. In addition, it is a unique feature and is highly significant for significant visual qualities and is a landmark of current cultural significance.
<b>A fish and wildlife resource:</b> Raptor nesting	Yes	The area is a known raptor nesting location for eagles and other raptors.
<b>A natural process or system:</b> Boar's Tusk geologic feature	Yes	Boar's Tusk is a unique geologic feature similar in age and significance to Devil's Tower. The feature is referred to as a volcanic core, composed of material that remained in the vent of the volcano as it became dormant. The visible remnants remained after the softer layers around it eroded away.
<b>Natural hazards:</b>	No	
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	This area is significant to Native American tribes and is a unique geologic feature. It also has local cultural significance.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The Boar's Tusk feature is composed of friable material and is considered unique. It is also a known navigational landmark.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The area has local and Tribal significance, and is a unique geologic feature.

Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	Yes	Activities such as climbing would damage the feature. The friable nature of the rock makes it a public safety issue.
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant historic, cultural, scenic, wildlife, and natural values, and is evaluated for future management actions in the Draft EIS.

**Figure C-8. Boar’s Tusk Geologic Feature**



## C.10 CROOKSTON HOMESTEAD PORTION OF THE GREATER SAND DUNES ACEC EVALUATION

<b>Area Considered</b>	<b>Historic Crookston Homestead</b>
<b>General Location</b>	T 23 N R 103 W sec 21, center N ½.
<b>General Description</b>	Historic homestead site, late 1800s stone construction, located next to Killpecker Sand Dunes.
<b>Public Land Acres</b>	500
<b>Values Considered</b>	Historic Crookston Ranch Homestead site

**History:** The Crookston Ranch Homestead is part of the Greater Sand Dunes ACEC but meets relevance and importance criteria on its own merits. It could be included as part of the Greater Sand Dunes ACEC or be designated as part of the Greater Sand Dunes ACEC.

(See Chapter 2 Management Action 7471)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Crookston Homestead buildings	Yes	The historic Crookston Ranch Homestead is one of the few examples of late 1800s natural stone construction ranch buildings. It is eligible for the NRHP.
<b>A fish and wildlife resource:</b>	No	
<b>A natural process or system:</b> Unknown water source for the spring	Yes	The spring runs year-long—even during the driest part of the season. The water source for this spring is unstudied but is most likely fed by the flockets in the sand dunes above it.
<b>Natural hazards:</b> Destabilized sand dunes	Yes	The shifting sand of the destabilized sand dunes is encroaching on the buildings and riparian area associated with the spring.
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	This highly significant cultural site is one of the best examples of late 1800s stone construction architecture found in this area. The area is part of a nationally and internationally recognized dune system.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The buildings are sensitive to seismic activity, whether natural or human caused. Buildings are deteriorating and will require stabilization in the future to retain their characteristic values.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The site is eligible for the NRHP.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant historic and cultural values, and is evaluated for future management actions in the Draft EIS.

**Figure C-9. Crookston Homestead**



## C.11 MONUMENT VALLEY ACEC EVALUATION

<b>Area Considered</b>	<b>Monument Valley</b>
<b>General Location</b>	The area is located 15 miles south of Interstate 80, mile marker 156, 12 miles north of the Colorado border, 28 miles east of U.S. Highway 430, and west of the Rock Springs Field Office boundary.
<b>General Description</b>	The area contains several outstanding geologic features including high cliffs and deep ravines with highly erodible clay soils.
<b>Public Land Acres</b>	69,955
<b>Values Considered</b>	Cultural: local and national significance. Scenic values: photographed geologic features, WSA. Wildlife: big game crucial winter range, raptor nesting. Paleontology: fossils of scientific interest.

**History:** This area was evaluated in the Green River RMP for potentially outstanding geologic features, prehistoric and historic clause of national significance and recreation values. Designation determinations were deferred at that time.

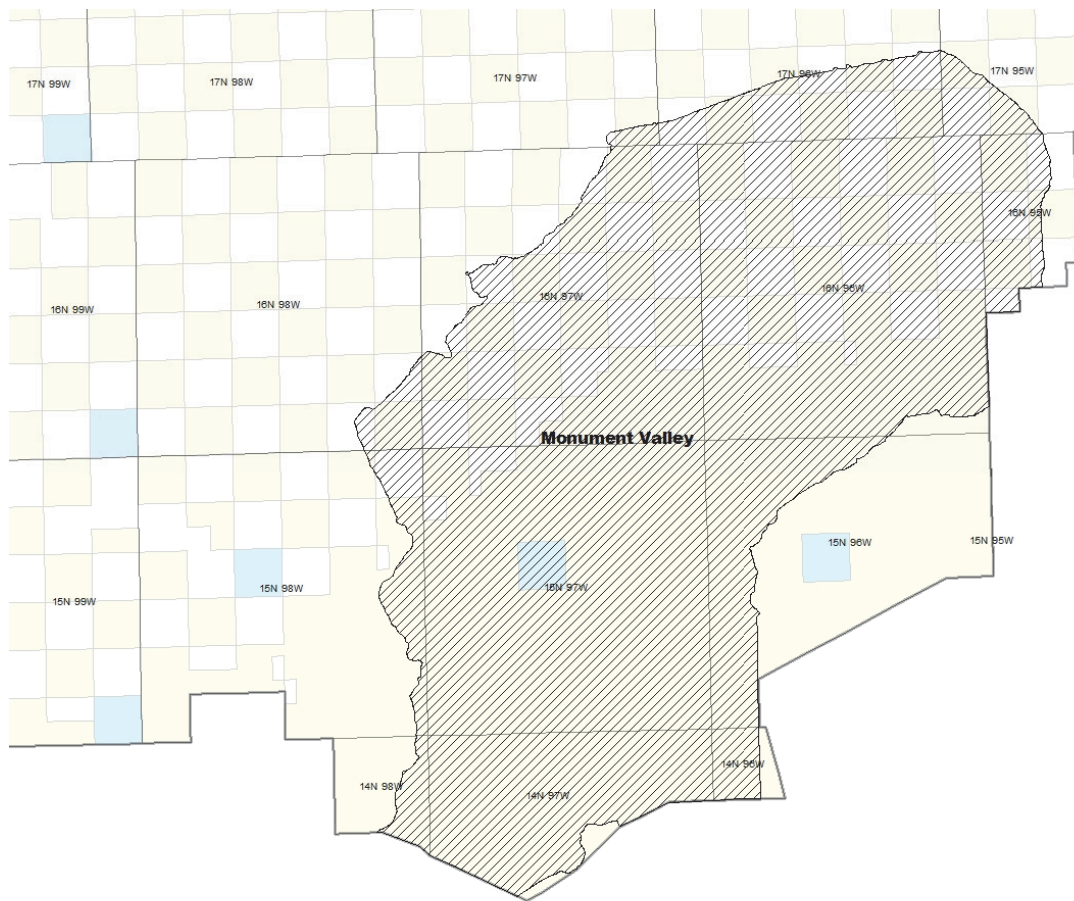
(See Chapter 2 Management Action 7340)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Adobe Town WSA High scenic values	Yes	This includes the north section of the Adobe Town WSA. In addition, areas around the WSA have similar geologic features including high cliffs and deep ravines. The area also contains high scenic values and is a well-known location for photography.
<b>A fish and wildlife resource:</b> Big game crucial winter range Raptor nesting	Yes	High cliffs found in the area provide excellent raptor nesting habitat. In addition, the area contains larger expanses of crucial winter range habitat for big game species.
<b>A natural process or systems:</b> Geologic features	Yes	The area has some of the most photographed geologic features in the field office, including steep, colorful cliffs and deep ravines.
<b>Natural hazards:</b> The area is composed of highly erosive clay soils	Yes	The highly erodible clay soils are extremely unstable.
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The area includes portions of the nationally recognized Adobe Town WSA. The high relief, steep colorful cliffs, and deep ravines provide visual variety. Photographers come from all areas of the country to photograph the features.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Fossils of scientific interest have been and continue to be studied in the areas inside and outside the WSA. These features are extremely susceptible to adverse change. In addition, the area includes big game crucial winter range habitat.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	This area contains portions of the Adobe Town WSA.

Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant cultural, paleontological, wildlife and scenic values, and is evaluated for future management actions in the Draft EIS.

**Figure C-10. Map of Monument Valley Area**



## C.12 NATURAL CORRALS ACEC EVALUATION

<b>Area Considered</b>	<b>Natural Corrals</b>
<b>General Location</b>	T 21 N R 102 W sec 12 and 18.
<b>General Description</b>	The Natural Corrals is a geographic feature composed of a spring that has eroded a steep valley. The area also contains some unique volcanic features. This valley contains intact archaeological data and serves as a watering location for surrounding wildlife.
<b>Public Land Acres</b>	631
<b>Values Considered</b>	Cultural/Historic: NRHP listed site, Natural Corrals and the ice caves. Wildlife: big game crucial winter range, big game parturition, designated Sublette mule deer migration corridor. Special Status Species: sage-grouse PHMA.

**History:** This area was evaluated in the Green River RMP. It was found to meet relevance and importance criteria for unique volcanic monoliths, prehistoric values of national significance, and outstanding recreation opportunities as identified when designated as an ACEC. The designation was retained.

(See Chapter 2 Management Action 7477)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Intact cultural resources Unique geologic features	Yes	The associated cultural site is listed with the NRHP and is a significant location with intact cultural resources. It is also nationally known for the geologic features which make up the 'ice caves'.
<b>A fish and wildlife resource:</b> Big game crucial winter range Big game parturition Sage-grouse PHMA	Yes	The area contains big game crucial winter range and parturition habitat and is located within a portion of the designated Sublette mule deer migration corridor. It is also within sage-grouse PHMA.
<b>A natural process or system:</b> Ice caves	Yes	The area contains some features that are similar to caves, where water is stored in the form of ice through the winter. In the warmer months, the ice remains shaded by the surrounding rock and the ice stays frozen long into the warmer months.
<b>Natural hazards:</b>	No	
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The area is listed with the NRHP as having high cultural significance. In addition, the area includes several volcanic features that are study locations for local schools.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The area contains big game crucial winter range and parturition habitat as well as sage-grouse PHMA.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The 'caves' are actually naturally occurring stacks of rocks which shade the interior and provide a cool location where stored ice remains frozen even through warmer summer months. The site also contains sage-grouse PHMA.  Interior Secretarial Order 3362 mandates protections for areas such as the designated Sublette mule deer migration corridor.



Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	Yes	The area is a recharge area for the water supply that serves the Town of Superior.
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant historic, cultural, wildlife and scenic values, and is evaluated for future management actions in the Draft EIS.

**Figure C-11. Map of Natural Corrals ACEC**



## C.13 OREGON BUTTES ACEC EVALUATION

<b>Area Considered</b>	<b>Oregon Buttes</b>
<b>General Location</b>	T 26 N R 101 W sections 2, 3, 10 and 11 and portions of sections 4, 9, 14 and 15.
<b>General Description</b>	The area is entirely within the Oregon Buttes and Whitehorse Creek WSAs but does not cover either of the WSAs in their entirety.
<b>Public Land Acres</b>	3,440
<b>Values Considered</b>	Cultural: historic navigation feature. Scenic values: Oregon Buttes feature and Continental Divide National Scenic Trail (CDNST). Geologic: unique feature with high cliffs. Wildlife: big game parturition, designated Sublette mule deer migration corridor, raptor nesting habitat. Special Status Species: sage-grouse PHMA

**History:** This area was evaluated in the Green River RMP and found to meet relevance and importance criteria for historic values and Geologic Landmark of National Significance. The ACEC designation was retained.

(See Chapter 2 Management Action 7486)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Cultural and historic Continental Divide National Scenic Trail	Yes	The Oregon Buttes served as an important landmark during the emigration period of U.S. history. In addition, the CDNST spur route connecting the CDNST to the county road is found in this area.
<b>A fish and wildlife resource:</b> Big game parturition Raptor nesting Sage-grouse PHMA	Yes	The high cliffs of the Oregon Buttes provide nesting habitat for raptors. The area also contains big game parturition habitat and sage-grouse PHMA.
<b>A natural process or system:</b> Unique geologic feature Paleontology resources	Yes	The area contains the Oregon Buttes, a nationally significant landmark and a unique geologic feature. In addition, the area includes type locations for geological study.
Natural hazards:	No	
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The geologic feature is a nationally recognized landmark. Pioneers emigrating to the west would look to that landmark to know when they had crossed the divide. In addition, the area is of high scenic value.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The area is entirely within the Oregon Buttes and Whitehorse Creek WSAs. The area also contains fragile soils which increases the management difficulties at the site.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The area is entirely within the Oregon Buttes and Whitehorse Creek WSAs. The area is a nationally recognized landmark used in the NHT. In addition, the area contains sage-grouse PHMA habitat. Interior Secretarial Order 3362 mandates protections for areas such as the designated Sublette mule deer migration corridor.

Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant historic, cultural, wildlife, and scenic values, and is evaluated for future management actions in the Draft EIS.

**Figure C-12. Map of Oregon Buttes ACEC**



## C.14 PINE SPRING EXPANDED ACEC EVALUATION

<b>Area Considered</b>	<b>Pine Springs and surrounding area</b>
<b>General Location</b>	The Pine Spring expanded ACEC portions of T 13 N R 109 W sec 5, 6, 7 and 8; T 13 N R 110 W sec 1 and 12; T 14 N R 109 W sec 29, 30, 31 and 32; T 14 N R 110 W sec 25 and 36.
<b>General Description</b>	Pine Spring is a Native American sacred landscape. It also includes portions of the Twin Buttes and Devils Playground WSAs and is an important study location for cultural and paleontology resources. Both WSA areas have outstanding scenic, recreation, archaeological, and paleontological values. The area is also representative of the sagebrush-steppe ecosystem in the Wyoming Basin Province ecoregion.
<b>Public Land Acres</b>	6,480
<b>Values Considered</b>	Cultural: - Pine Spring cultural site and significant tribal concerns. Paleontology: intact paleo-sequencing for the Eocene. Plant community: old growth juniper.

**History:** The existing site was determined to meet relevance criteria 1 and importance criteria 1 and 2 as a Landmark of National Significance as identified when originally designated as an ACEC. The Green River RMP retained this designation and expanded it to 6,030 acres. Subsequent research revealed other culturally significant sites which warrant protection and the area is recommended for expansion in this effort.

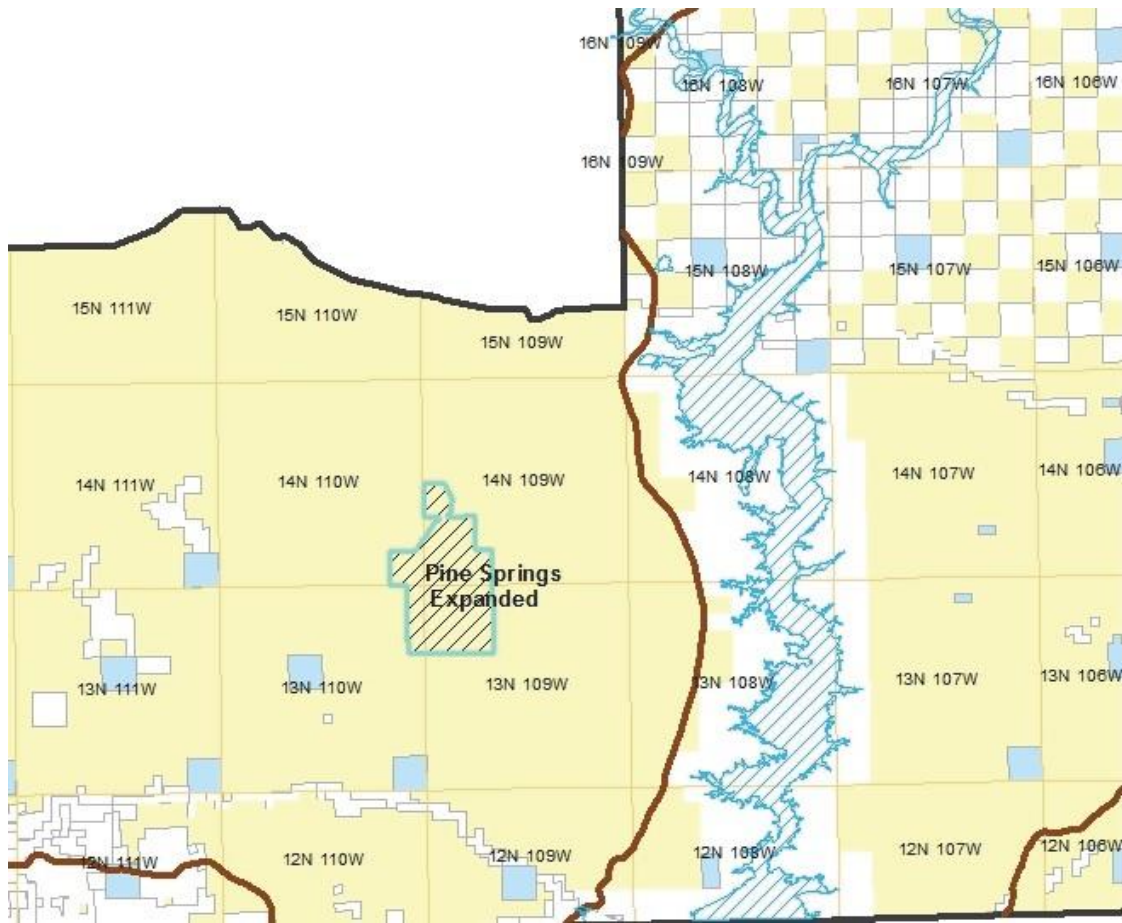
(See Chapter 2 Management Action 7490)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Native American Sacred Landscape WSAs	Yes	This inventory unit includes the Pine Spring Archaeological Site, and numerous other sites of cultural significance as well as a culturally important Native American landscape. In addition, the inventory unit is a known location for scientifically important fossil assemblages. The area contains portions of the Twin Buttes and Devils Playground WSAs.
<b>A fish and wildlife resource:</b>	No	
<b>A natural process or system:</b> Paleontology study location Geology interpretation Old-growth juniper	Yes	The area contains significant paleontology resources and is used as a teaching area by several universities to study intact paleo-sequencing for the Eocene, specifically the Bridger series. There are also known concentrations of chromium diopside and Pyrope garnet found along drainages. This inventory unit includes a portion of the Devils Playground WSA, so called because of the unusual erosion features found in the northeast portion of the WSA. The area also includes a portion of the Twin Buttes WSA, an erosion feature so unique it is considered a landmark. In addition, the entire unit includes stands of old growth juniper, considered to be a unique plant community.
<b>Natural hazards:</b>	Yes	Due to the fragile nature of the unstable soils that make up the Devils Playground and Twin Buttes features, and the highly erodible nature and salt content of soils in the balance of the inventory unit, the area is prone to unstable soils.

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	Intact provenience of 9,000 years of human habitation at the Pine Spring cultural site is of national scientific importance. The presence of numerous fossil localities in conjunction with paleontological data of similar strata in adjacent areas suggests that the inventory unit could contain intact faunal sequences of significant scientific interest.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The area is recognized as a Traditional Cultural Property (TCP) and a Sacred Landscape. Numerous stone circle sites are present within the proposed area and these have been determined to be of cultural significance. The Twin Buttes and Devils Playground WSAs are of high scenic value, meet the wilderness characteristics required under FLPMA and are highly susceptible to adverse change.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	Several cultural sites located within the inventory unit are eligible for listing with the NRHP. The area contains portions of the Twin Buttes and Devils Playground WSAs.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant historic, cultural, and paleontological values, and is evaluated for future management actions in the Draft EIS.

Figure C-13. Map of Pine Springs Expanded Area



## C.15 THE PINNACLES ACEC EVALUATION

<b>Area Considered</b>	<b>The Pinnacles Geographic Area</b>
<b>General Location</b>	Portions of T 24 N R 100 W sec 1, 2, 3, 4, 9, 10, 11, 12, 13, 14, 15, 21, 22, 23, 24, 25, 26 and 27.
<b>General Description</b>	Areas of high desert sagebrush communities surrounding the Pinnacles Geologic Feature.
<b>Public Land Acres</b>	1,969
<b>Values Considered</b>	Scenic: Pinnacles Feature, focal landscape. Wildlife: big game crucial winter range, raptor nesting. Geology: unique fractured and friable rock feature.

**History:** Evaluation of The Pinnacles was deferred in the Green River RMP due to location within the Jack Morrow Hills planning area. The Jack Morrow Hills CAP evaluation determined that The Pinnacles met relevance 1 and importance 1 and 2 as having significant scenic value and natural processes or systems, for more than locally significant qualities that make the area fragile, sensitive, rare and vulnerable to adverse change. The management area was further determined to be effectively manageable as part of the Red Desert Watershed Management Area. The added relevance criterion for wildlife elevates the significance of the area. This area is also part of the Red Desert and may be considered for management as part of the Red Desert ACEC or as an independent ACEC.

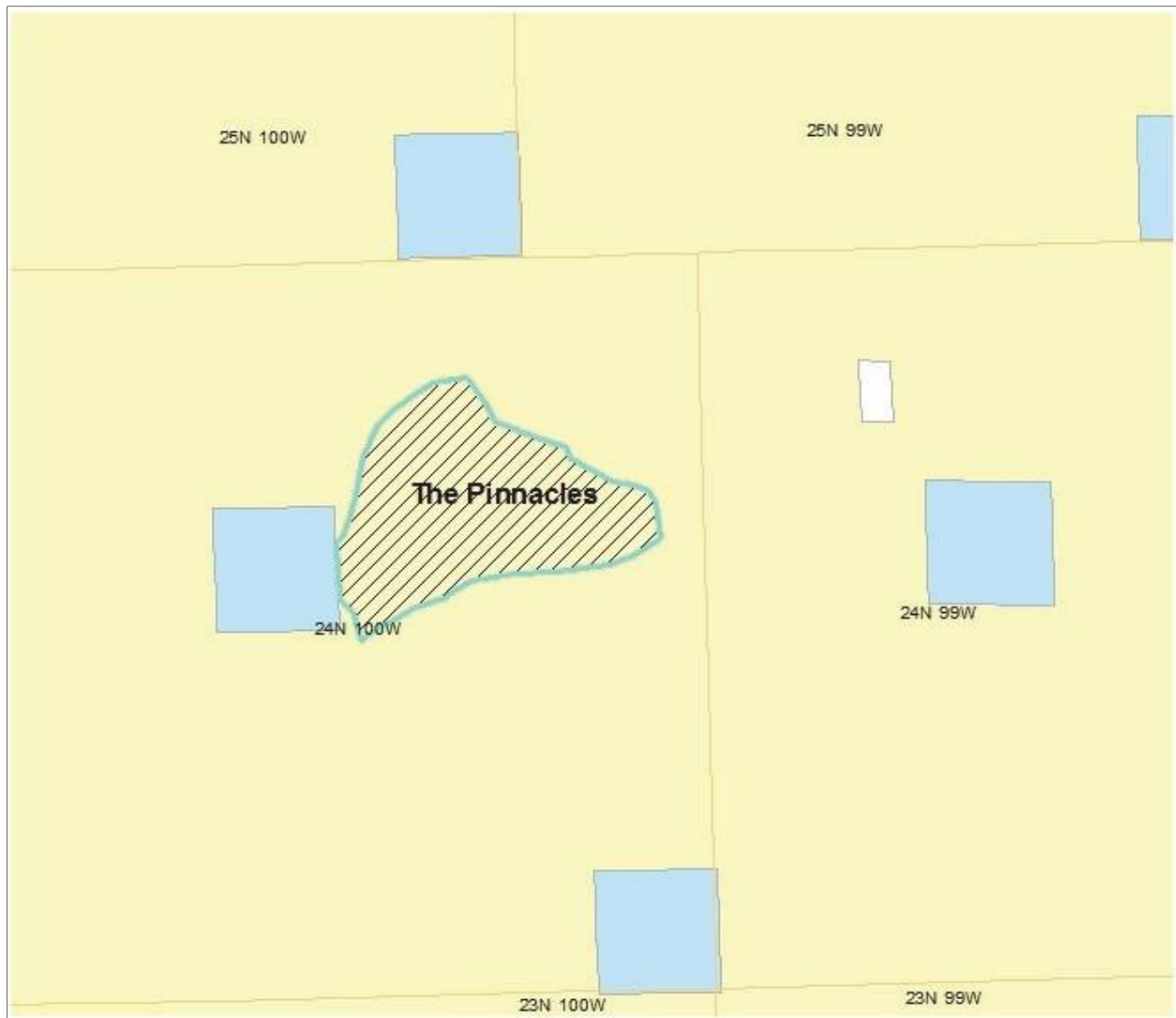
(See Chapter 2 Management Action 7336)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Scenic	Yes	The area is a focal landscape, meaning the eye is automatically drawn to the feature and that feature presents a striking difference from the surrounding area providing a higher than normal degree of visual variety.
<b>A fish and wildlife resource:</b> Big game crucial winter range Raptor nesting	Yes	The area is identified as big game crucial winter range. The steep sides of The Pinnacles provide nesting habitat for raptors.
<b>A natural process or system:</b> The geologic feature	Yes	The base rock which makes up the feature is fragile and friable. Such features are considered unique and irreplaceable.
<b>Natural hazards:</b>	No	
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The area is listed with the Visual Resource Inventory (VRI) Class II.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The Pinnacles feature is considered a unique resource, fragile, friable and not replaceable.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	

Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant wildlife, geologic, and scenic values, and is evaluated for future management actions in the Draft EIS.

**Figure C-14. Map of The Pinnacles Area**





## C.16 WESTERN PORTION OF THE RED DESERT WATERSHED ACEC EVALUATION

<b>Area Considered</b>	<b>West portion of the Red Desert</b>
<b>General Location</b>	The west portion of the Red Desert is that area south of the north boundary of Honeycomb Buttes WSA, west of the Continental Divide, north of the checkerboard lands, and west of the Jack Morrow Hills planning area boundary.
<b>General Description</b>	The area generally consists of high-desert sagebrush communities and includes The Pinnacles geologic feature and all of the Alkali Draw, South Pinnacles and Honeycomb Buttes and portions of the Oregon Buttes WSAs.
<b>Public Land Acres</b>	162,983
<b>Values Considered</b>	Scenic: VRI Class II, CDNST. Wildlife: big game crucial winter range, big game parturition, designated Sublette mule deer migration corridor. Special Status Species: sage-grouse PHMA, large-fruited bladderpod. Geology: Pinnacles feature, hydrologically closed basin.

**History:** In the Green River RMP the entire Red Desert Watershed area met relevance criteria 1 and 3 but failed to meet importance criteria. It was deferred in the Green River RMP due to portions of the area being located within the Jack Morrow Hills planning area. The west portion of the Red Desert is the area inside the Jack Morrow Hills boundary. This area could be added to the Steamboat Management Area or could be managed as an independent ACEC. The eastern portion is outside the Jack Morrow Hills planning area and did not meet the relevance and importance criteria.

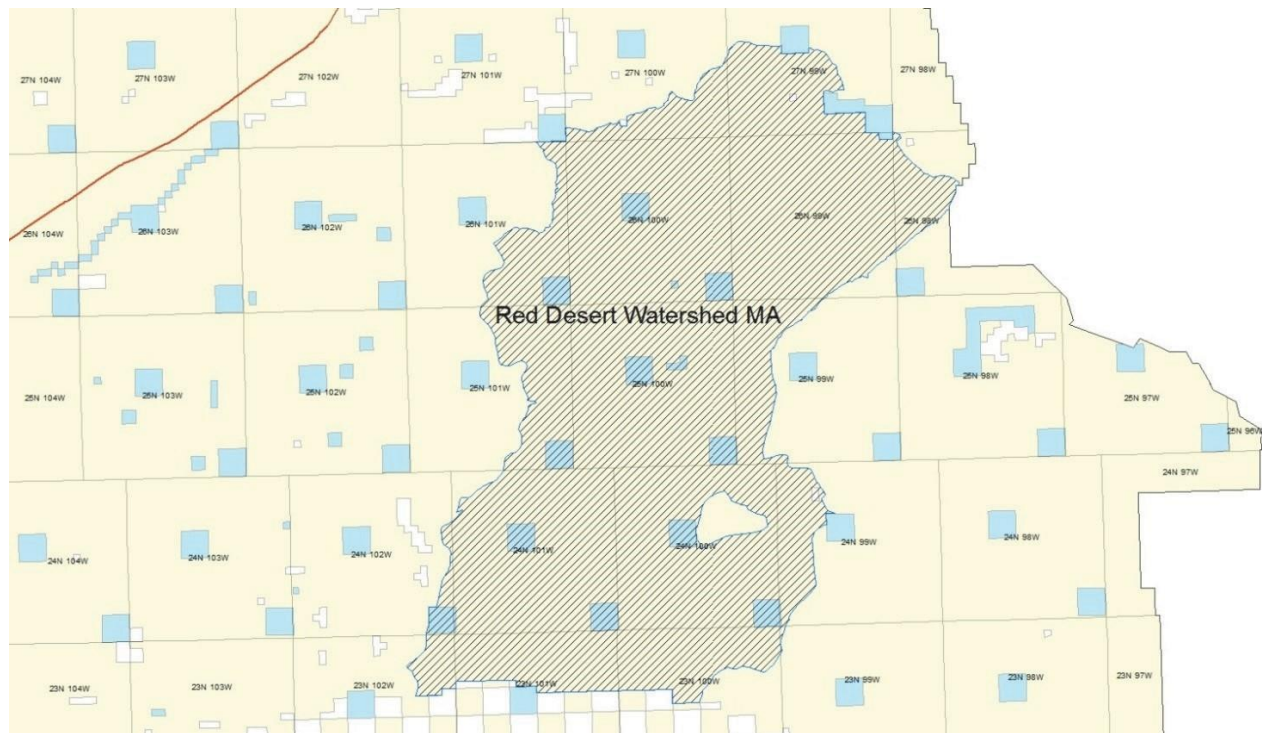
(See Chapter 2 Management Action 7446)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Scenic values Continental Divide National Scenic Trail	Yes	The entire area is inventoried as VRI Class II. Further the entire area is identified as a location where maintaining visual quality has high value. The area also contains part of the Continental Divide Connecting Side Trail portion of the CDNST.
<b>A fish and wildlife resource:</b> Big game crucial winter range Sage-grouse PHMA Sublette mule deer migration corridor	Yes	The area contains big game crucial winter range and parturition habitat, as well as portions of the designated Sublette mule deer migration corridor. It contains a small portion of sage-grouse PHMA.
<b>A natural process or system:</b> The Pinnacles Water recharge area BLM sensitive plants	Yes	The area is important as a hydrologically closed basin along the Continental Divide, making it a water recharge area. Further, the area contains habitat for the large-fruited bladderpod, a BLM sensitive species. In addition, the area contains The Pinnacles, a unique geologic feature.
<b>Natural hazards:</b>	No	
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The northern boundary is the Connecting Side Trail to the CDNST giving it national significance. In addition, the area includes all of three WSAs and part of a fourth WSA. The area is also a hydrologically closed basin and contains the Pinnacles feature.

Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	This area includes the laterite layers of the badlands making up the south portion of the Oregon Buttes WSA. These easily erodible features are extremely fragile. The area includes the Pinnacles Geologic Feature, considered to be unique and distinctive, is also rare, fragile, and irreplaceable and would require additional protection measures.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The area is a hydrologically closed basin. The area contains BLM sensitive plant species. The area contains portions of sage-grouse PHMA. Interior Secretarial Order 3362 mandates protections for areas such as the designated Sublette mule deer migration corridor.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant wildlife, geology, and scenic values, and is evaluated for future management actions in the Draft EIS.

**Figure C-15. Red Desert Watershed Area, Western Portion**



## C.17 WIND RIVER FRONT ACEC EVALUATION

### Wind River Front East portion of the South Wind River ACEC Evaluation

<b>Area Considered</b>	<b>South Wind River</b>
<b>General Location</b>	The area includes everything west of the Continental Divide Road, north of State Highway 28, and west of the Rock Springs Field Office boundary.
<b>General Description</b>	The area includes the west slopes of the Wind River Front. The Lander Cutoff of the Oregon Trail, the Sweetwater Wild and Scenic River (WSR), and the CDNST are all found in this area.
<b>Public Land Acres</b>	86,937
<b>Values Considered</b>	Historic: Lander cutoff of the Oregon Trail, prehistoric steatite quarry. Scenic: CDNST, WSR. Wildlife: big game crucial winter range, big game parturition, designated Sublette mule deer migration corridor. Special Status Species: sage-grouse PHMA, Fremont County rockcross, meadow pussytoes, limber pine.

**History:** This is a new ACEC proposal.

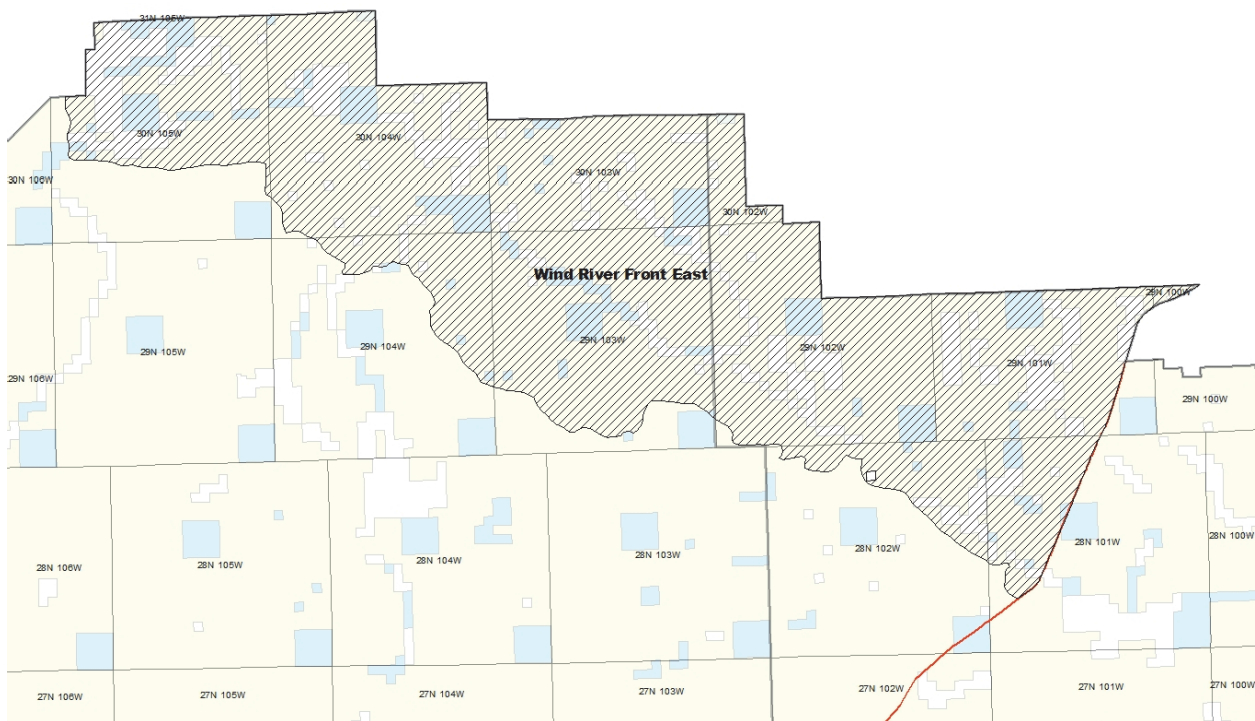
(See Chapter 2 Management Action 7539)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Wind River Front SRMA Lander Cutoff NHT Continental Divide National Scenic Trail	Yes	The boundaries for this portion coincide with the Wind River Front East SRMA. The area includes portions of NHT, WSR and CDNST.
<b>A fish and wildlife resource:</b> Big game crucial winter range, Big game parturition Sublette mule deer migration corridor Sage-grouse PHMA	Yes	This area contains large portions of big game crucial winter range and parturition habitat. The designated Sublette mule deer migration corridor also crosses the inventory unit. Most of the area contains sage-grouse PHMA.
<b>A natural process or system:</b> Fremont county rockcross Meadow pussytoes Known regional recharge area	Yes	The slopes of the Wind River range provide important water recharge due to the location as the Continental Divide. In addition, there are known locations for BLM sensitive plant species, including Fremont county rockcross, meadow pussytoes and limber pine.
<b>Natural hazards:</b>	No	
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The area includes a prehistoric steatite quarry used by Native American Tribes. The area also contains high value scenic resources that are considered extremely important, including the CDNST. The area is also characterized by high recreation use.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The CDNST and NHT which cross this area are rare, and unique. The settings for these trails are extremely vulnerable to adverse change.

Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The area contains NHT. The area contains BLM sensitive plant species. This area contains large portions of sage-grouse PHMA. Interior Secretarial Order 3362 mandates protections for areas such as the designated Sublette mule deer migration corridor.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant historic, wildlife, and scenic values, and is evaluated for future management actions in the Draft EIS.

**Figure C-16. Map of the Wind River Front Area, East Portion**



## C.18 WIND RIVER FRONT WEST PORTION OF THE SOUTH WIND RIVER ACEC EVALUATION

<b>Area Considered</b>	<b>Wind River Front West</b>
<b>General Location</b>	The area includes lands east of State Highway 191, north of the Township 27/28 line, and south and west of the Continental Divide Road and the northern boundary of the Rock Springs Field Office.
<b>General Description</b>	The area generally consists of high desert sagebrush plant communities and contains portions of the Big and Little Sandy River drainages.
<b>Public Land Acres</b>	171,172
<b>Values Considered</b>	Historic: Buckskin Crossing Cemetery. Wildlife: big game crucial winter range, big game parturition, designated Sublette mule deer migration corridor. Special Status Species: sage-grouse PHMA, bluehead sucker, flannelmouth sucker, round-tail chub, limber pine.

**History:** This is a new ACEC proposal.

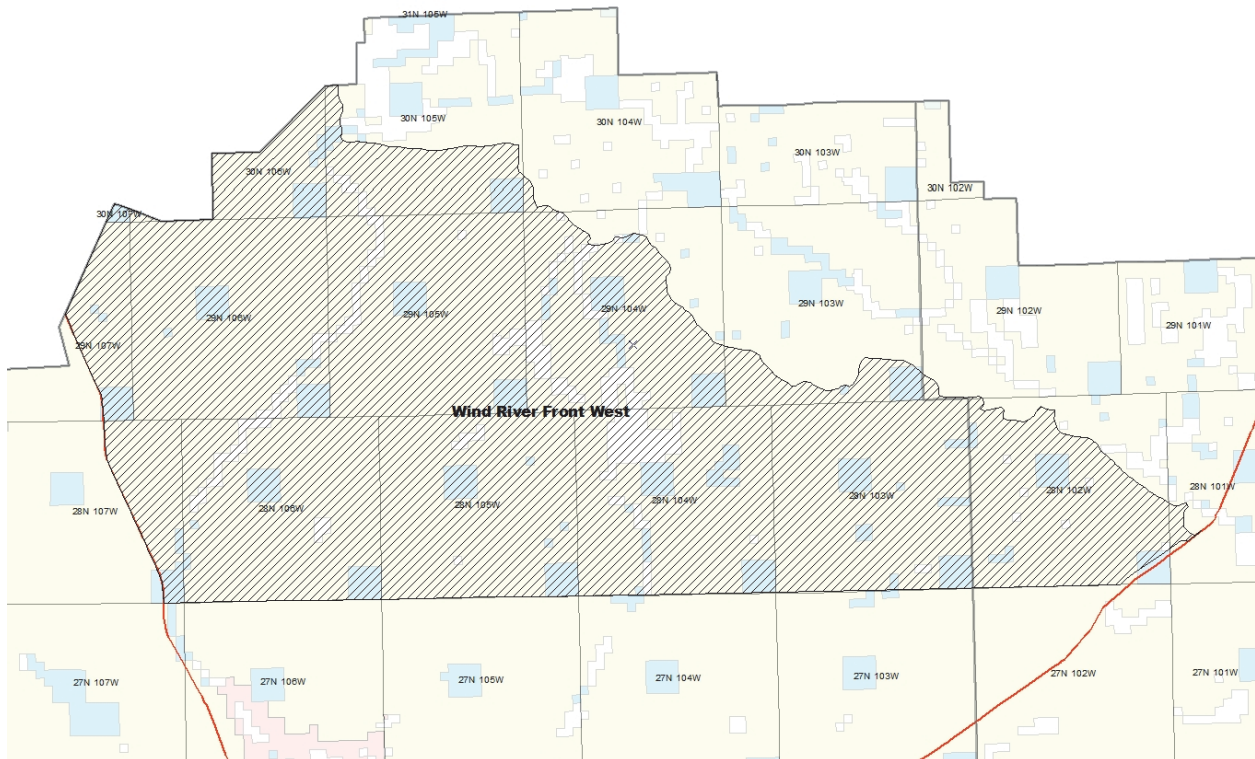
(See Chapter 2 Management Action 7538)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Recreation management (rivers) Buckskin Crossing Cemetery	Yes	The area includes the Big Sandy River; a known fishing destination. In addition, there is a historic cemetery near where the Lander Cutoff crosses the Sandy River referred to as Buckskin Crossing Cemetery.
<b>A fish and wildlife resource:</b> Big game crucial winter range Big game parturition Sage-grouse PHMA Special Status fish species Sublette mule deer migration corridor	Yes	The area contains large portions of big game crucial winter range and some big game parturition habitat. The unit also is entirely within sage-grouse PHMA, contains portions of the Big Sandy river, which has known populations of BLM sensitive fish species, including bluehead sucker, flannelmouth sucker, and round-tail chub.
<b>A natural process or system:</b>	No	
<b>Natural hazards:</b>	No	
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The entire area is within sage-grouse PHMA and contains large portions of big game crucial winter range.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The area contains habitat for multiple Special Status Species, including sage-grouse PHMA, bluehead sucker, flannelmouth sucker, and round-tail chub.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The entire area is within sage-grouse core PHMA. The area contains habitat for BLM sensitive fish species. Interior Secretarial Order 3362 mandates protections for areas such as the designated Sublette mule deer migration corridor.

Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant historic, wildlife, and recreation values, and is evaluated for future management actions in the Draft EIS.

**Figure C-17. Map of Wind River Front Area, West Portion**



## C.19 SANDY RIVERS PORTION OF THE SOUTH WIND RIVER ACEC EVALUATION

<b>Area Considered</b>	<b>Sandy Rivers (South Wind River)</b>
<b>General Location</b>	This area includes lands east of U.S. Highway 191 near the town of Farson, WY, north of U.S. Highway 28, and south of the Township 27/28 line.
<b>General Description</b>	The area includes the longest intact sections of the Oregon, California, Pony Express, and Mormon Pioneer NHTs and several nationally significant associated sites, including The Parting of the Ways. The area is a known location for aquatic Special Status Species.
<b>Public Land Acres</b>	117,184
<b>Values Considered</b>	Cultural: NHT. Wildlife: big game crucial winter range, designated Sublette mule deer migration corridor. Special Status Species: sage-grouse PHMA, bluehead sucker, flannelmouth sucker, and round-tail chub. Paleontological resources: middle Eocene fossil resources. Scenic: panoramic landscape.

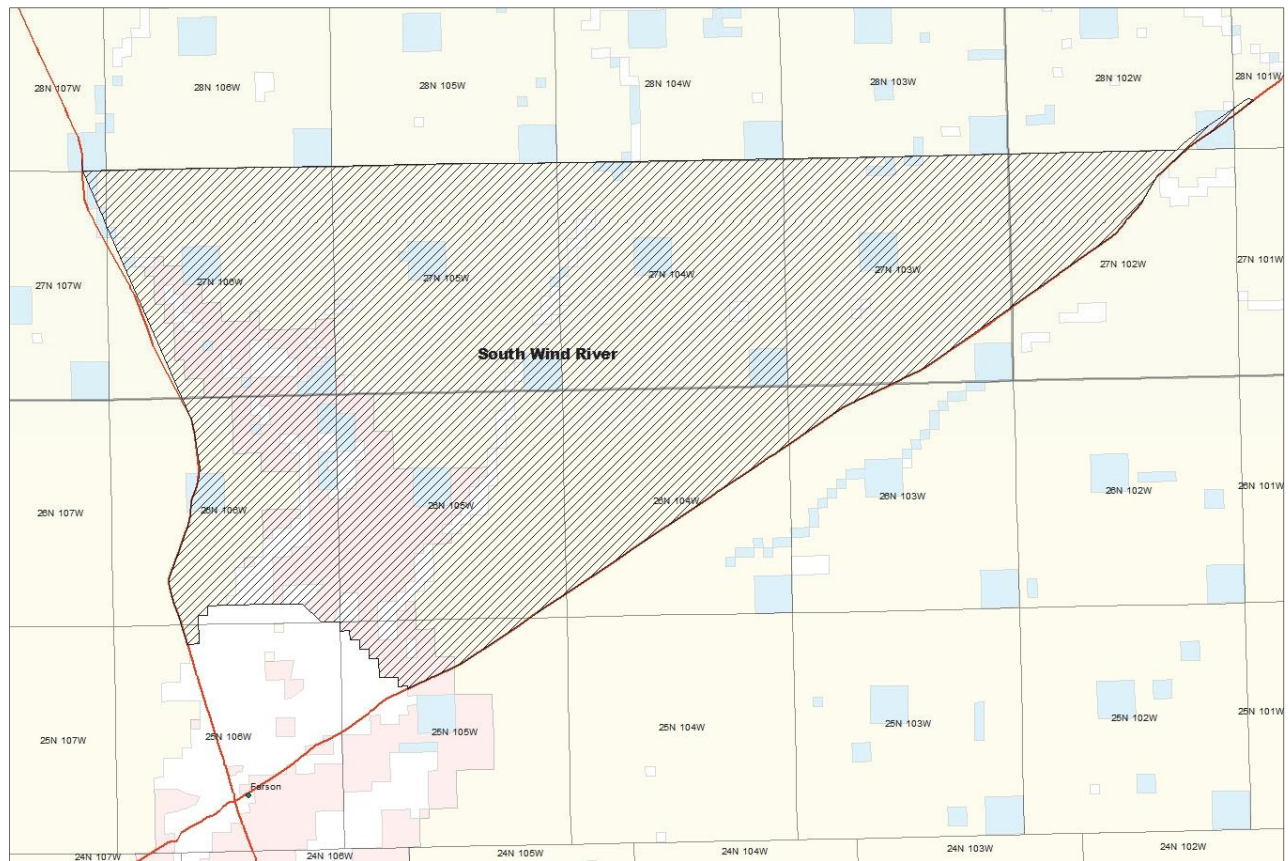
**History:** This is a new ACEC proposal.

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> NHTs Historic tourism recreation use	Yes	The most intact sections of the Oregon, California, Pony Express, and Mormon Pioneer trails cross through this area. The area also includes several nationally significant sites associated with the trails, including The Parting of the Ways. As a result, the area is extremely important for heritage tourism.
<b>A fish and wildlife resource:</b> BLM sensitive species Sage-grouse PHMA Big game crucial winter range Sublette mule deer migration corridor	Yes	The area contains several BLM sensitive species, including sage-grouse PHMA, bluehead sucker, flannelmouth sucker, and round-tail chub. The area is also big game crucial winter range habitat and is crossed by portions of the designated Sublette mule deer migration corridor.
<b>A natural process or system:</b> Water recharge area Paleontology	Yes	This area is an important water recharge area. In addition, surface geology includes the Laney member of the Green River formation, a study location for the middle Eocene fossil resources.
<b>Natural hazards:</b>	No	
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	This area contains four NHTs and other sites including The Parting of the Ways.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The area contains large expanses of undisturbed landscape. This situation is described in the BLM Visual Resource Management Manual as a panoramic landscape and is identified in the VRI as a location where maintaining visual quality has high value. The area is also crossed by the designated Sublette mule deer migration corridor.

Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The area contains NHT, sage-grouse PHMA, and BLM sensitive fish species. Interior Secretarial Order 3362 mandates protections for areas such as the designated Sublette mule deer migration corridor.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant historic, wildlife, paleontological, and scenic values, and is evaluated for future management actions in the Draft EIS.

**Figure C-18. Map of the Sandy Rivers Area**





## C.20 BIG SANDY OPENINGS ACEC EVALUATION

<b>Area Considered</b>	<b>Big Sandy Openings</b>
<b>General Location</b>	T 30 N R 104 W sec 5, 6, 7 and 8.
<b>General Description</b>	The area is a section of the Big Sandy River as it crosses from the National Forest to BLM managed and includes half a mile on either side of the high-water mark.
<b>Public Land Acres</b>	757
<b>Values Considered</b>	Scenic: visual variety. Wildlife: big game crucial winter range, big game parturition. Special Status Species: sage-grouse PHMA.

**History:** The area meets relevance and importance criteria and could be considered as an independent ACEC or be managed as part of the (proposed) South Wind River ACEC.

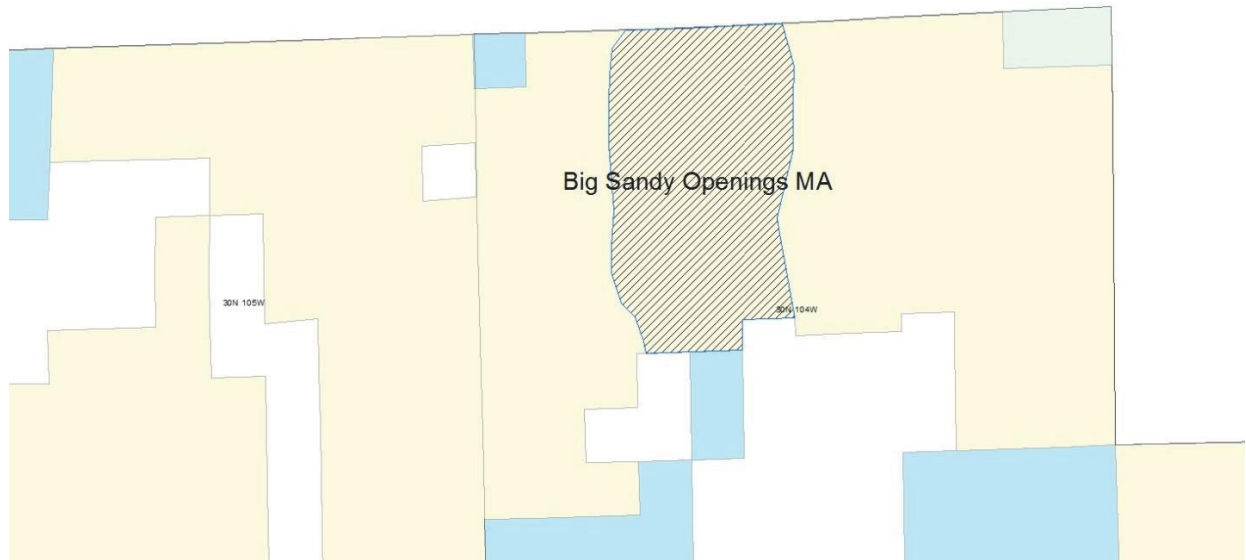
(See Chapter 2 Management Action 7563)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Scenic	Yes	The river and associated canyon are considered pristine; that is, the area appears unchanged by human interaction. The river and canyon system through this 1 ½ miles present a high degree of visual variety.
<b>A fish and wildlife resource:</b> Big game crucial winter range Big game parturition Sublette mule deer migration corridor Sage-grouse PHMA	Yes	The inventory unit includes big game crucial winter range and parturition habitat. It also contains a portion of the designated Sublette mule deer migration corridor. The unit also contains sage-grouse PHMA.
<b>A natural process or system:</b>	No	
<b>Natural hazards:</b> Pine bark beetle	Yes	The area includes large areas of beetle-killed pine trees and as such is a significant hazard for fire.
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	No	
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	This is an undeveloped area where retaining the visual setting has a high value.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The area includes sage-grouse PHMA habitat. Interior Secretarial Order 3362 mandates protections for areas such as the designated Sublette mule deer migration corridor.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	

Poses a significant threat to human life and safety or to property.	No	
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**Findings:** This nomination meets the relevance and importance criteria for a significant wildlife and scenic values, and is evaluated for future management actions in the Draft EIS.

**Figure C-19. Map of the Big Sandy Openings Area**



**Figure C-20. Big Sandy Openings**



## C.21 SOUTH PASS HISTORIC LANDSCAPE ACEC EVALUATION

<b>Area Considered</b>	<b>South Pass</b>
<b>General Location</b>	The lands east of U.S. Highway 28, north of the Oregon Buttes and Honeycomb Buttes WSA boundary roads and the White Horse Creek road, west of the field office boundary, and south of Slaughterhouse Creek.
<b>General Description</b>	The area includes four NHTs where they crossed the Continental Divide at the only location available to do so during the westward emigration period.
<b>Public Land Acres</b>	171,300
<b>Values Considered</b>	Cultural: four National Historic Trails including the Oregon Trail, the California Trail, the Mormon Pioneer Trail and the Pony Express Trail, National Historic Landmark, Tribal significance. Scenic: National Scenic Trail. Wildlife: designated Sublette mule deer migration corridor, big game crucial winter range and parturition habitat. Special Status Species: sage-grouse PHMA, limber pine, meadow pussytoes, Fremont County rockcress.

**History:** The area was identified in the Green River RMP as an ACEC, meeting relevance and importance criteria for historic and scenic values of national significance and for outstanding geographic features. The values were thought to need special emphasis to be effectively managed. The ACEC designation was carried forward in the Jack Morrow Hills process. The proposed boundary would be altered to take in the valleys between the existing boundaries and the WSA in the south and the existing boundaries and the rim of Slaughterhouse Gulch. This will allow boundaries to match the ACEC boundary in the Lander Field Office.

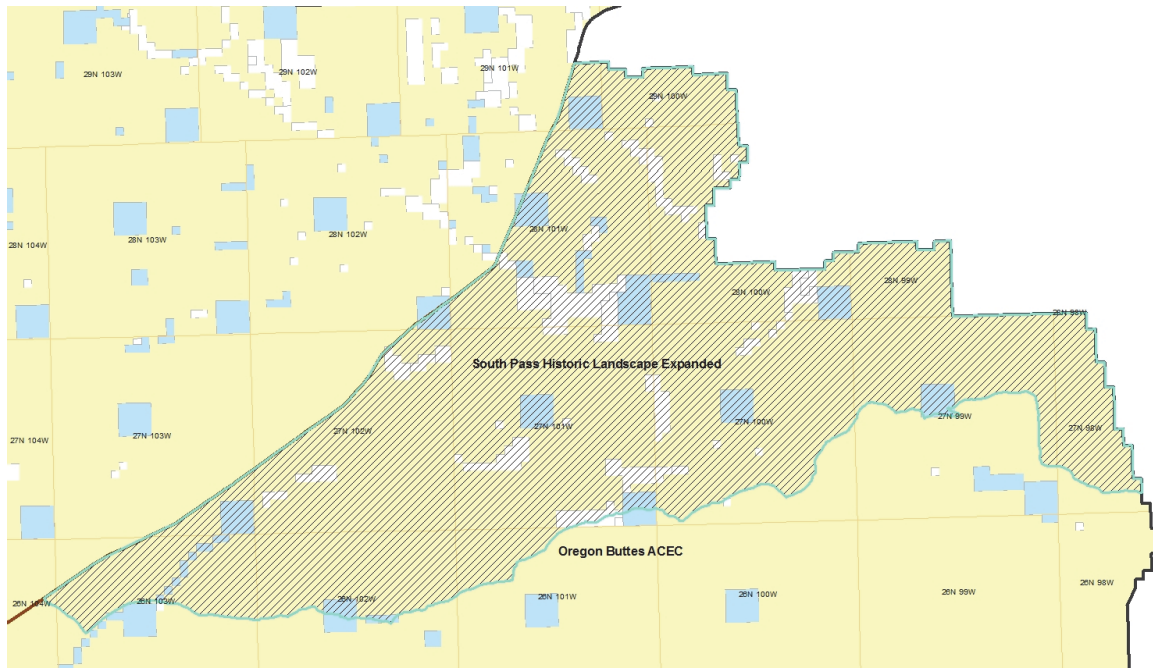
(See Chapter 2 Management Action 7498)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Cultural Scenic	Yes	The area contains South Pass, the only location where the mountains could be crossed by wagons and handcars during the westward emigration period of U.S. history. The area also takes in several of the visual landmarks used to navigate the trail system. These landmarks and surrounding landscape are part of the panoramic landscape associated with the Continental Divide.  The South Pass National Historic Landmark was designated in 1961. Four nationally significant NHTs cross through this area. South Pass is centrally located in the unit. Three known human burials along with countless unknown burials and many sites associated with the westward emigration.  This area is also of high significance currently, historically, and prehistorically to the Native American Tribes.
<b>A fish and wildlife resource:</b> Sublette mule deer migration corridor Big game crucial winter range Big game parturition Sage-grouse PHMA	Yes	The area is part of the designated Sublette mule deer migration corridor. It is also known big game crucial winter range and parturition habitat. In addition, it is sage-grouse PHMA.

<b>A natural process or system:</b> BLM sensitive plant species Water recharge area	Yes	This area contains BLM Sensitive Species including limber pine, meadow pussytoes and Fremont County rockcress. In addition, due to the proximity of the Continental Divide the area is a known water recharge area.
<b>Natural hazards:</b>	No	
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The NHTs and South Pass are both on the NRHP due to their national significance. The south boundary is the CDNST connecting side trail. The designated South Pass National Historic Landmark is within this area. This area is also of high significance to Native American Tribes.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The area contains populations of BLM sensitive plant species, including limber pine, meadow pussytoes and Fremont County rockcress. The trail segments include several known and many unknown human burial sites, as well as other trail related sites. The area is also sage-grouse PHMA and includes portions of the designated Sublette mule deer migration corridor.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The National Scenic and Historic Trails and the South Pass National Historic Landmark warrant extra protection in order to preserve their scenic value and context. Protections are in place for sage-grouse PHMA. Interior Secretarial Order 3362 mandates protections for areas such as the designated Sublette mule deer migration corridor.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant cultural, scenic, and wildlife values, and is evaluated for future management actions in the Draft EIS.

Figure C-21. Map of the South Pass Historic Landscape Expanded Area



## C.22 SPECIAL STATUS PLANT ACEC EVALUATION

<b>Area Considered</b>	<b>Special Status Plants</b>
<b>General Location</b>	Identified locations for Special Status plant species and their habitats.
<b>General Description</b>	Special Status plant species and habitats throughout the planning area.
<b>Public Land Acres</b>	1,122
<b>Values Considered</b>	Special Status plants including BLM sensitive and species being considered for listing under the Endangered Species Act (ESA).

**History:** The Special Status Plant ACEC was reviewed in the Green River RMP and found to meet relevance and importance criteria for natural processes or systems and importance criteria of more than local significant qualities, fragile, sensitive, rare and vulnerable to adverse change, and warrants protection to satisfy national priority concerns and carry out the mandates of FLPMA. The values in this area need special emphasis to be effectively managed. The Special Status plant areas known to exist in the Jack Morrow Hills area were reevaluated for that effort and designation was retained for species in that area.

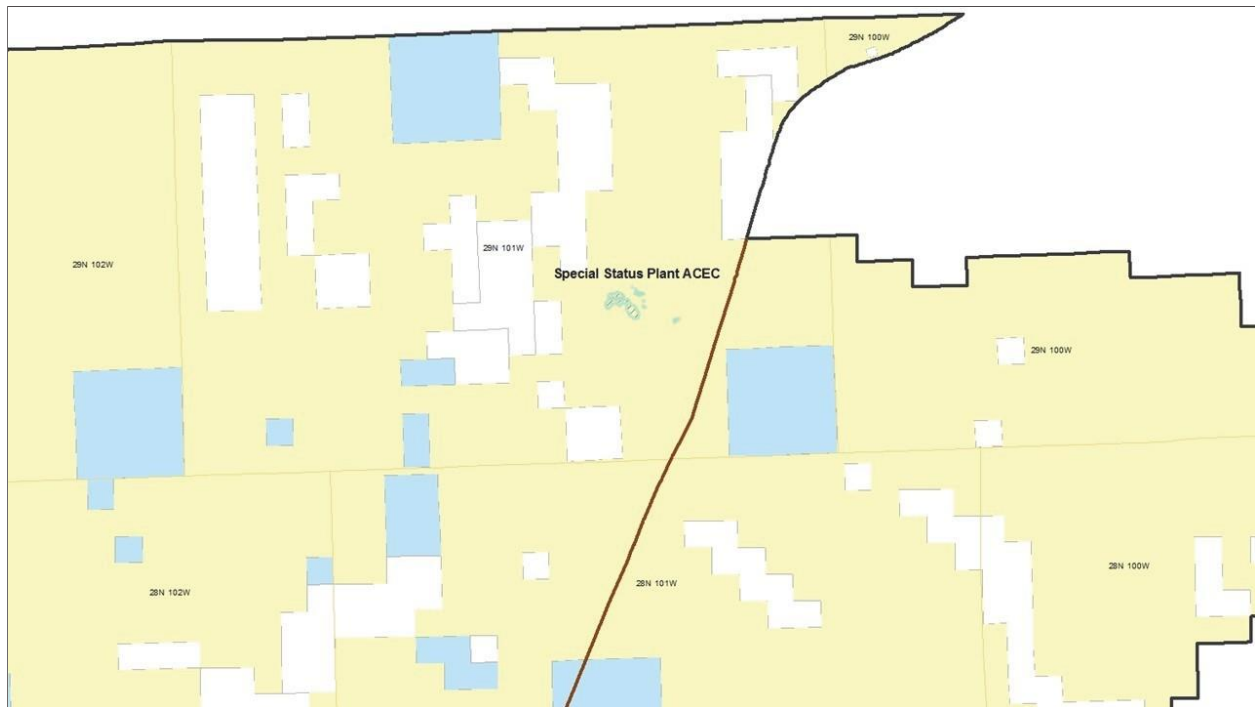
(See Chapter 2 Management Action 7508)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
A significant historic, cultural, or scenic value:	No	
A fish and wildlife resource:	No	
A natural process or system:	Yes	The areas that are known to contain Special Status plant species and the surrounding habitat necessary to maintain them.
Natural hazards:	No	
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	Special Status Species are considered of state-wide or national significance, including species that have been petitioned for listing as threatened or endangered under the ESA.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Species are designated as Special Status due to their fragile, sensitive, and rare nature.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	These areas are protected in order to prevent the species from being listed as threatened or endangered under the ESA. The designation as an ACEC and associated protections were identified in recent ESA listing decisions as factors preventing the need for listing.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	

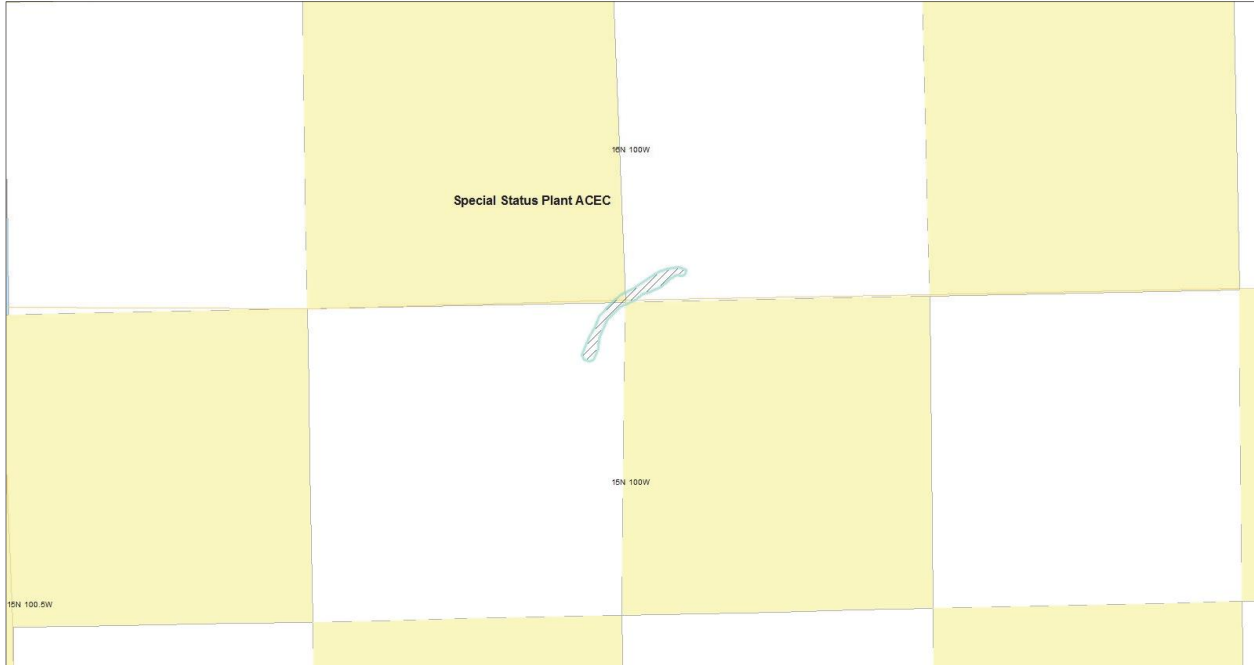
**Findings:** This nomination meets the relevance and importance criteria for Special Status Species values and is evaluated for future management actions in the Draft EIS.

Current listings found in the Rock Springs Field Office include *Arabis pusilla* (Fremont County rockcress), *Astragalus proimanthus* (precocious milkvetch), *Descurainia torulosa* (Wyoming tansymustard), *Thelesperma caespitosum* (Green River greenthread), *Thelesperma pubescens* (Uinta greenthread), and *Townsendia microcephala* (Cedar Mountain Easter daisy). This proposed area also includes *Lesquerella macrocarpa* (large-fruited bladderpod) and the basin big sage/lemon scurfpea plant community. These species could be removed from the list or other species may be added to the list as Special Status Species listings change over time.

**Figure C-22. Maps of the Special Status Plant ACEC**









## C.23 STEAMBOAT ACEC EVALUATION

<b>Area Considered</b>	<b>Steamboat Mountain Area</b>
<b>General Location</b>	This area includes lands east of U.S. Highway 191, north of the checkerboard lands, west of the Continental Divide, and south of U.S. Highway 28, exclusive of other ACEC boundaries.
<b>General Description</b>	This area encompasses several wildlife and Special Status Species habitat. In addition, there are significant visual and cultural resources throughout the area.
<b>Public Land Acres</b>	268,202
<b>Values Considered</b>	Cultural: Tribal significance, Tri-territory Historic Site. Scenic: Steamboat Mountain. Wildlife: big game crucial winter range, big game parturition, designated Sublette mule deer migration corridor. Special Status Species: sage-grouse PHMA, limber pine, basin big sagebrush/lemon scurfpea communities.

**History:** The Steamboat area was evaluated in the Green River RMP and found to meet relevance and importance criteria for wildlife and cultural values. Unique habitat features exist which are found nowhere else in the planning area. Special emphasis was considered to be required for effective management. A portion of this proposed expansion was recommended to be retained as an ACEC. In the Jack Morrow Hills effort, the Steamboat expansion was reviewed again. The expansion was found to meet relevance and importance criteria for wildlife, cultural values, and natural systems, and determined to require special management to be effectively managed. The area originally identified in the Green River RMP was retained with the Jack Morrow Hills effort.

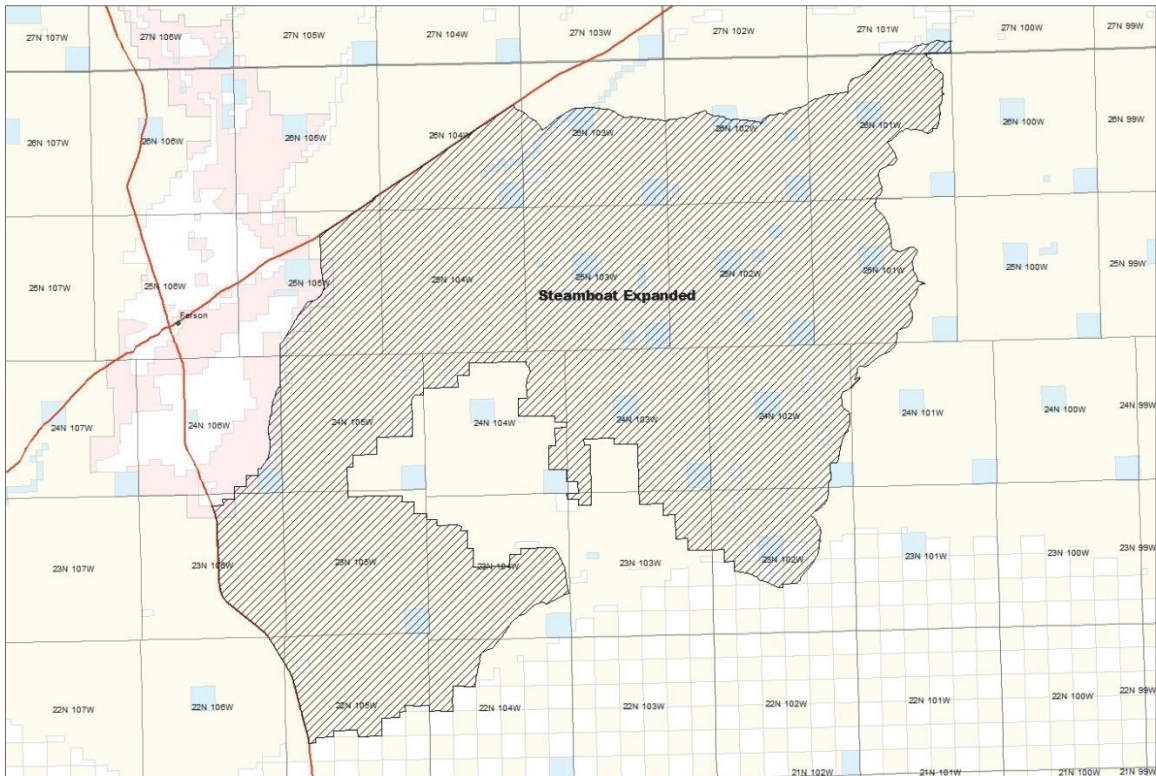
(See Chapter 2 Management Action 7516)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Indian Gap and associated trail Tri-territory Site Scenic	Yes	The area includes the Indian Gap and associated Indian Gap Trail used by Tribes to travel between Fort Washakie and Fort Hall and access the White Mountain Petroglyphs and Boar's Tusk sites for traditional cultural purposes. The trail has high cultural significance to the Tribes.  This area includes the Tri-territory Historic Site marking a historic boundary between The Louisiana Purchase, Northwest Territory, and Mexico.  The entire area was inventoried at Visual Resource Inventory Classes I (WSA only) and II, and maintaining visual integrity has high value.
<b>A fish and wildlife resource:</b> Big game winter and parturition habitat Big game parturition closure Sublette mule deer migration corridor Sage-grouse PHMA	Yes	The area has crucial winter range and parturition habitat for big game species. It is also includes portions of the designated Sublette mule deer migration corridor. In addition, the entire area is listed as sage-grouse PHMA. This area contains the only seasonal closure for big game parturition in the planning area.
<b>A natural process or system:</b> Special Status plant species. Volcanic features and rare earth mineral potential	Yes	The area contains relic plant communities. The area also has known locations for basin big sagebrush/lemon scurfpea communities, limber pine, and old growth sagebrush communities.  In addition, the area contains several locations where volcanic features are present and has been identified as potential for rare earth minerals.
<b>Natural hazards:</b>	No	

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The area includes the Tri-territory Historic Site, which is a site of national significance. The area also has a higher than normal density of cultural sites including human burials and pit-house features.  The inventory unit also includes portions of the designated Sublette mule deer migration corridor as well as sage-grouse PHMA.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	These unique plant communities are by their very nature considered fragile, sensitive, and rare.  The inventory unit includes the only big game partition closure in the planning area to provide protection for big game during the birthing season.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The area includes the Tri-territory Historic Site, which is a site of national significance. The area also has a higher than normal density of cultural sites including human burials and pit-house features. The sage-grouse PHMA area and Special Status plant areas are considered national priority concerns. Interior Secretarial Order 3362 mandates protections for areas such as the designated Sublette mule deer migration corridor.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant historic, cultural, wildlife, and scenic values, and is evaluated for future management actions in the Draft EIS.

Figure C-23. Map of the Steamboat Expanded Area



## C.24 WHITE MOUNTAIN PETROGLYPHS ACEC EVALUATION

<b>Area Considered</b>	<b>White Mountain</b>
<b>General Location</b>	T 22 N R 105 W sec 11 and 12.
<b>General Description</b>	White Mountain Petroglyphs Rock Art Site.
<b>Public Land Acres</b>	21
<b>Values Considered</b>	Cultural: White Mountain Petroglyphs/rock art. Wildlife: raptor nesting, big game crucial winter range. Special Status Species: sage-grouse PHMA. Recreation: developed site with off-site facilities.

**History:** The area was evaluated in the Green River RMP and found to meet relevance and importance criteria for cultural values of national significance when the area was originally designated an ACEC. The designation was retained.

(See Chapter 2 Management Action 7530)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b> Rock art site Native American sacred and respected place High recreation use area	Yes	The White Mountain Petroglyphs is a Native American sacred and respected place of significance to Tribes and is still used as a TCP. In addition, the site has been developed as a recreation site where visitor controls have been installed to protect the site from vandalism and improve the visitor experience.
<b>A fish and wildlife resource:</b> Raptor nesting Big game crucial winter range Sage-grouse PHMA	Yes	The area has raptor nests above the rock art panels, that are often active. In addition, several of the big game species carved into the rock art panels frequent the area still, and the area is within big game crucial winter range. In addition, the area is sage-grouse PHMA.
<b>A natural process or system:</b> White Rocks cave	Yes	The rock art panels also include a shallow cave eroded out of the sandstone. The presence of this cave increases the significance of this site as a TCP.
<b>Natural hazards:</b>	No	
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The rock art panels have tribal significance, as well as having special meaning and worth.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The rock art and the cave, being sandstone, are fragile and sensitive. Rock art sites are by definition rare, irreplaceable, and vulnerable to adverse change.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	The White Mountain Petroglyphs site is a Native American sacred and respected place of significance to several Tribes and is still used as a TCP. In addition, the site has been developed as a recreation site where visitor controls have been installed to protect the site from vandalism and improve the visitor experience. The area is within sage-grouse PHMA.

Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	

**Findings:** This nomination meets the relevance and importance criteria for a significant cultural, wildlife, and recreation values, and is evaluated for future management actions in the Draft EIS.

**Figure C-24. Map of the White Mountain Petroglyphs ACEC**



## C.25 EAST SAND DUNES – RED LAKE ACEC EVALUATION

<b>Area Considered</b>	<b>East Sand Dunes – Red Lake</b>
<b>General Location</b>	T 23 N R 97 W, T 23 N R 98 W, T 23 N R 99 W and T 23 N R 100 W.
<b>General Description</b>	The area includes the East Sand Dunes and Red Lake WSAs, both of which have outstanding scenic, recreation, and wildlife values. The area is also part of the Greater Sand Dunes system providing opportunities for scientific study of natural sand dunes.
<b>Public Land Acres</b>	22,338
<b>Values Considered</b>	Wildlife: big game crucial winter range. Scientific study: study of active dunes and perennial wetlands. Geology: active sand dunes.

**History:** This is a new evaluation based on a citizen proposed ACEC.

(See Chapter 2 Management Action 7548)

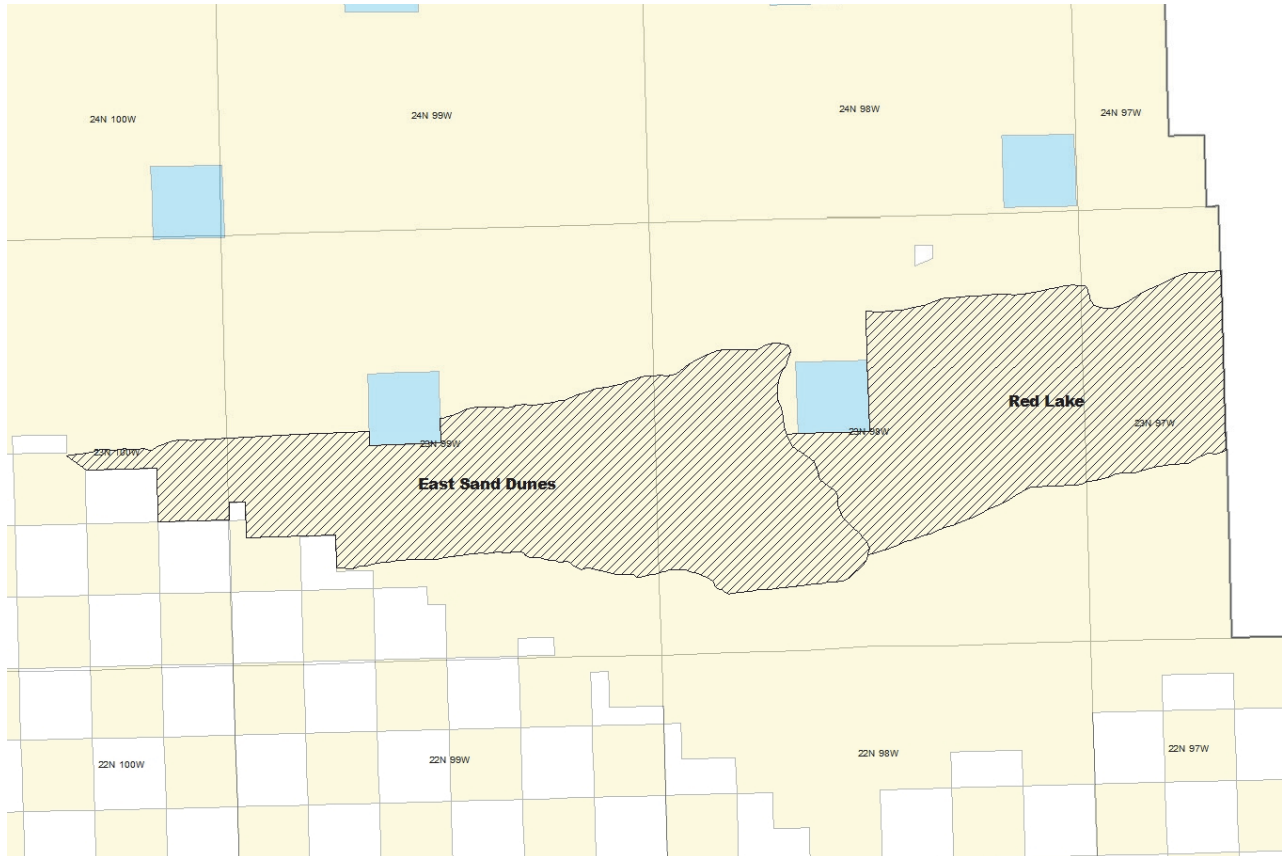
<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b>	No	This area does not contain any known significant or important historic or cultural resources. Because this area contains active sand dunes, there is high potential for cultural resources.
<b>A fish and wildlife resource:</b> Big game crucial winter range	Yes	This area contains big game crucial winter range habitat.
<b>A natural process or system:</b>	Yes	This area is a part of the Greater Sand Dunes system. The combination of active dunes and cold environment produces many unique conditions. The area is of significant scientific value for the study of active sand dunes, the associated perennial wetlands that are directly linked to the active dunes, and how they interact in response to weather and climate.
<b>Natural hazards:</b>	No	
<b>Importance Value</b>	<b>Yes/No</b>	<b>Rationale for Determination</b>
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	No	While there is potential for cultural resources, these resources have not been identified. Known resource values in the area do not rise to the level of significance to meet this criterion. Active dunes are valuable for scientific study.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The area, being an active sand dune, is susceptible to motor vehicle trespassing. Any resource values with intact provenience within the dunes would be destroyed by motor vehicle trespassing. The remnant dunal ponds are unique ecosystems useful for scientific study.
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	The boundary of this area is the same as the two WSAs.
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	



Poses a significant threat to human life and safety or to property.	No	
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**Findings:** This nomination meets the relevance and importance criteria for significant wildlife and scientific study values, and is evaluated for future management actions in the Draft EIS.

**Figure C-25. Map of the East Sand Dunes – Red Lake Area**



## C.26 BIG GAME MIGRATION CORRIDOR ACEC EVALUATION

<b>Area Considered</b>	<b>Big Game Migration Corridor</b>
<b>General Location</b>	T 20 N R 101, 102 W sec Various; T 21 N R 101,102,103,104 W sec Various; T 22 N R 102, 103, 104 W sec Various; T 23 N R 102, 103, 104 W sec Various; T 24 N R 101, 102, 103, 104 W sec Various; T 25 N R 100, 101, 102, 103, 104 W sec Various; T 26 N R 100, 101, 102, 103, 104 W sec Various; T 27 N R 99, 100, 101, 102, 103, 104 W sec Various; T 28 N R 99, 101, 102, 103, 104 W sec Various; T 29 n R 101, 102, 103, 104, 105 W sec Various; T 30 N R 102, 103, 104, 105 W sec Various.
<b>General Description</b>	The 150-mile Red Desert to Hoback migration corridor crosses private, state trust and National Forest land, but a significant portion of the corridor is public land managed by the BLM. All the public land sections are within the administration of the High Desert District. Most are within the Rock Springs Field Office and are known as the Red Desert and Big Sandy sections of the corridor. Researchers have estimated that roughly 500 deer leave winter range in the Red Desert to travel to the Hoback Basin. Along the way, they pick up 4,000-5,000 other deer that winter in the Prospect Mountains.
<b>Public Land Acres</b>	224,402
<b>Values Considered</b>	Cultural: NHT. Wildlife: designated Sublette mule deer migration corridor, big game crucial winter range, big game parturition. Special Status Species: sage-grouse PHMA.

**History:** This is a new evaluation based on a citizen proposed ACEC.

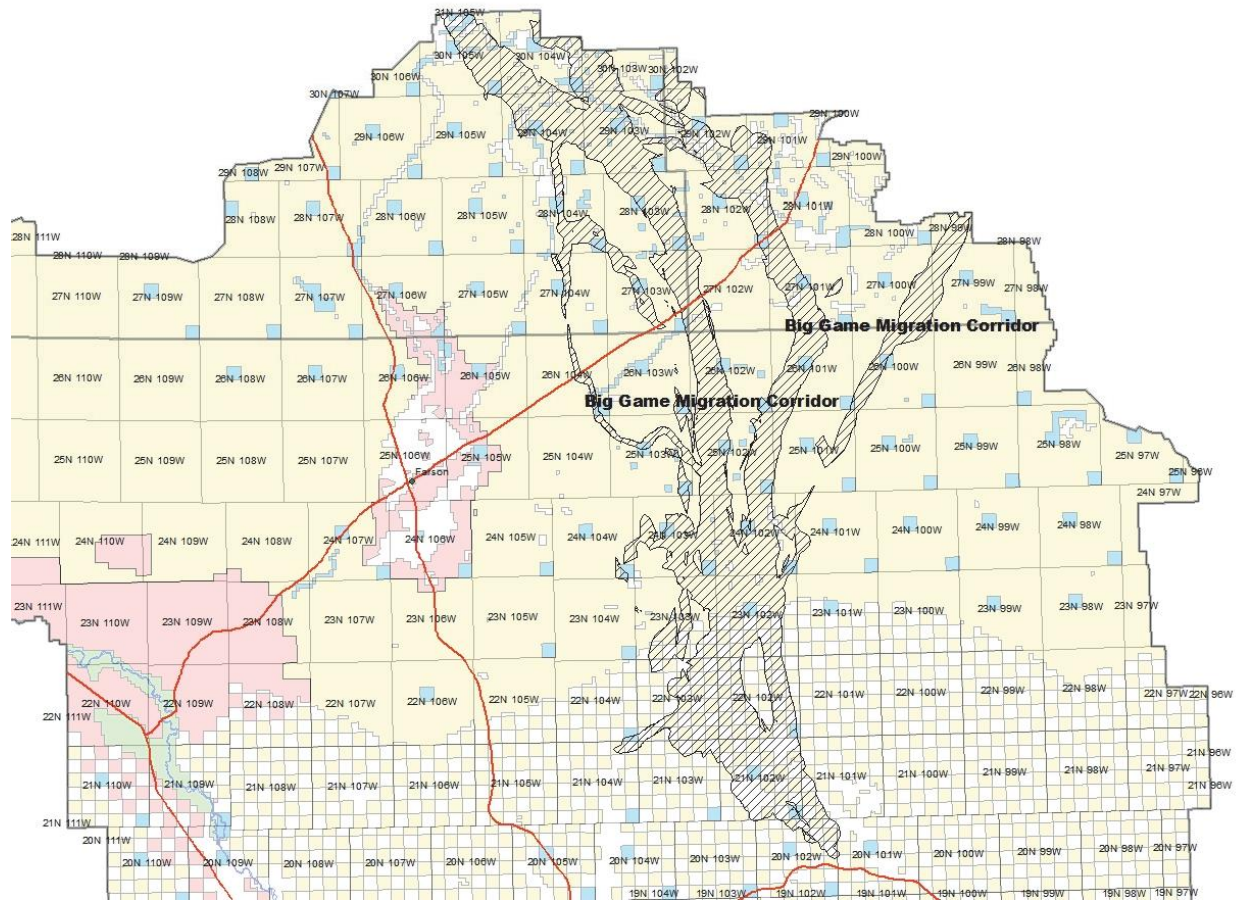
(See Chapter 2 Management Action 7555)

<b>Relevance Value</b>	<b>Meets Value (Yes/No)</b>	<b>Rationale for Determination</b>
<b>A significant historic, cultural, or scenic value:</b>	Yes	The corridors include portions of the Oregon Buttes, White Horse Creek, and Honeycomb Buttes WSAs. These areas have been set aside, in part, because of high scenic value.  The corridors cross the South Pass Historic Landscape, the South Pass National Historic Landmark and several sections of the Emigrant Trail as well as the Natural Corrals Cultural Site and other significant cultural sites. The Natural Corrals and the NHT are listed with the NRHP.
<b>A fish and wildlife resource:</b> Sublette mule deer migration corridor Sage-grouse PHMA	Yes	The area is a significant migration corridor for large game species. The area also contains sage-grouse PHMA.
<b>A natural process or system:</b>	Yes	The corridors include the Wind River Front Special Management area, an area set aside because of the high scenic value and recreation resource use.  The corridor includes portions of basin big sagebrush/lemon scurfpea plant communities. The corridors also include populations of two BLM sensitive plant species, meadow pussytoes and large-fruited bladderpod.
<b>Natural hazards:</b>	No	

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	<p>The scenic values present in the corridors are considered significant and essential for recreation, public appreciation, and tourism.</p> <p>The Emigrant Trail is a part of the American Westward expansion. It is a unique and irreplaceable resource.</p> <p>The migration corridor is the longest known mule deer migration corridor in the U.S. and is traveled by up to 5,000 deer twice each year.</p>
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	<p>The basin big sagebrush/lemon scurfpea communities are fragile, rare, and vulnerable to adverse change. The meadow pussytoes and large-fruited bladderpod populations and their habitat are fragile, sensitive, and vulnerable to adverse change.</p> <p>The Emigrant Trail and the South Pass are unique and irreplaceable.</p> <p>The area is also sage-grouse PHMA.</p>
Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	<p>Protection of scenic values and preservation and management of the Historic Trails is recognized as a national priority concern, which contains portions of the migration corridor.</p> <p>The area contains protections related to various other resources, including sage-grouse PHMA, raptor nesting, trails and other cultural sites, the Superior aquifer recharge area, ACECs and WSAs.</p>
Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.	No	
Poses a significant threat to human life and safety or to property.	No	

**Findings:** The corridors meet relevance criteria for wildlife resources but also for scenic and cultural resources and rare plant communities, and is evaluated for future management actions in the Draft EIS.

Figure C-26. Map of the Big Game Corridor



# APPENDIX D—FEDERAL OIL AND GAS OPERATIONS ON SPLIT ESTATE LANDS

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## D.1 PURPOSE

The purpose of this appendix is to summarize the Bureau of Land Management's (BLM) procedures for considering proposals to conduct exploration and production operations on split estate federal oil and gas leases. This appendix is provided for information purposes only, and is not necessarily a complete statement of rights, obligations, or processes. This appendix is not a part of the BLM's land use plan decision for the Resource Management Plan (RMP). Any conflict with any statute or regulation is unintentional. In the event of a conflict, the statute or regulation controls. Federal oil and gas lessees and operators, and private surface owners, are advised to confer with the BLM at the time an action is proposed for BLM's consideration, in order to obtain information about the current regulations and policies that may apply to the proposal. Nothing in this appendix affects the authority of any Tribe or of the Bureau of Indian Affairs in any way. This RMP applies to federal lands as defined by the Federal Land Policy and Management Act of 1976 (FLPMA), and does not apply to lands held in trust for any Tribe or for any individual Indian or Indians.

## D.2 DEFINITIONS

*Casual use (operations)*: “Casual use means activities involving practices that do not ordinarily lead to any appreciable disturbance or damage to lands, resources, or improvements. This term does not apply to private surface. Casual use includes surveying activities” (Onshore Oil and Gas Order No. 1, part II).

*Lease*: “Means any contract, profit share arrangement, joint venture or other agreement issued or approved by the United States under a mineral leasing law that authorizes exploration for, extraction of or removal of oil or gas” (Onshore Oil and Gas Order No. 1, part II).

*Lease facility or production facility*: “Production facilities means a lessee's or lease operator's pipes and equipment used on the leasehold to aid in extracting, processing, and storing oil and gas...” (64 Federal Register [FR] 32140). See also BLM Manual Section 2880 (“Mineral Leasing Act Rights-of-Way”) at page 9.

*Lease site*: “Means any lands, including the surface of a severed mineral estate, on which exploration for, or extraction and removal of, oil or gas is authorized under a lease” (43 Code of Federal Regulation [CFR] 3160.0-5).

*Lessee*: “Means any person holding record title or owning operating rights in a lease issued or approved by the United States” (43 CFR 3160.0-5).

*Operator*: “Means any person or entity including but not limited to the lessee or operating rights owner, who has stated in writing to the Authorized Officer that it is responsible under the terms and conditions of the lease for the operations conducted on the leased lands or a portion thereof” (43 CFR 3160.0-5).

*Public lands*: “Means any land and interest in land owned by the United States within the several States and administered by the Secretary of the Interior through the Bureau of Land Management...” (FLMPA, Sec. 103(e)).

*Private surface owner:* “Private Surface Owner means a non-federal or non-state owner of the surface estate and includes any Indian owner of surface estate not held in trust by the United States” (Onshore Oil and Gas Order No. 1, part II).

*Split estate:* “Split Estate means lands where the surface is owned by an entity or person other than the owner of the Federal or Indian oil and gas” (Onshore Oil and Gas Order No. 1, part II). “When tribal lands are held in trust or are subject to federal restrictions against alienation the Bureau of Indian Affairs is the Surface Managing Agency, but if lands are held in unrestricted fee, those lands are treated the same as private surface” (Preamble to Onshore Oil and Gas Order No. 1 revisions, 72 FR 10322-10323, March 7, 2007).

*Surface Managing Agency:* “Surface Managing Agency means any Federal or state agency having jurisdiction over the surface overlying Federal or Indian oil and gas” (Onshore Oil and Gas Order No. 1, part II).

## **D.3 GENERAL**

In considering and authorizing exploration and development of split estate federal oil and gas leases, the BLM prefers that the operator and split estate surface owner reach a Surface Access Agreement for proposed oil and gas operations. The BLM coordinates with both the operator and surface owner, in accordance with the requirements of Onshore Oil and Gas Order No. 1, and generally provides the surface owner’s lands the same level of resource (soil, water, vegetation, air, visual, cultural, etc.) protection as would be required on BLM-administered public lands.

“The BLM will offer the surface owner the same level of surface protection that the BLM provides on Federal surface. The BLM will not apply standards or conditions that exceed those that would normally be applied to Federal surface, even when requested by the surface owner” (The Gold Book, page 12).

Federal mineral lessees may enter onto a privately owned surface to the extent necessary to explore and produce the federal minerals in compliance with the relevant statutes, BLM regulations, and land use designations. The BLM does not have the authority to regulate a surface owner’s use of the surface estate, but does have the authority to regulate the activities of federal mineral lessees and mining claimants. The BLM adds lease stipulations to split estate federal oil and gas leases in order to ensure that leasing decisions conform to the approved RMP for the area.

## **D.4 OPERATIONS**

### **D.4.1 Geophysical**

The BLM’s authority to permit geophysical operations is described under 43 CFR §3150.0-1:

*Geophysical exploration on public lands, the surface of which is administered by the Bureau, requires Bureau approval. The procedures in this part also apply to geophysical exploration conducted under the rights granted by any Federal oil and gas lease unless the surface is administered by the U.S. Forest Service. However, a lessee may elect to conduct exploration operations outside the rights granted by the lease, in which case authorization from the surface managing agency or surface owner may be required... The procedures of this part do not apply to... operations conducted on private surface overlying public lands unless such operations are conducted by a lessee under the rights granted by the Federal oil and gas lease...*

As BLM Handbook H-3150-1<sup>1</sup> at pages 1–2 explains:

*In those situations where Federal minerals are underlying private surface and the private surface owner's consent is obtained, the BLM is not to become involved. However, when landowner consent for access to the surface cannot be obtained for geophysical exploration operations on a Federal lease by the lease operator, the geophysical operation is to be authorized using the Sundry Notice process...<sup>2</sup>*

*When the geophysical exploration operator is the Federal lessee or designated operator of the lessee, it is to file a Sundry Notice... with the BLM and provide notification to the surface owner by certified mail that it intends to enter onto the lands and conduct lease operations. The lessee/operator must then submit proof to the BLM Authorized Officer that the surface owner has been notified. The lessee or operator must also submit proof to the BLM Authorized Officer that it has a current and adequate bond payable to the United States for use by the surface owner for damages caused during exploration operations. The Authorized Officer must give the surface owner 30 days to comment on the proposed action before approving the Sundry Notice.*

When a surface access agreement is reached to conduct geophysical operations on split estate lands with leased or unleased federal oil and gas, the BLM does not become involved.

The BLM will not accept a Notice of Intent (NOI) to Conduct Geophysical Operations, BLM Form 3150-4 or bond to permit entry to split estate lands with unleased federal oil and gas, since the BLM has not issued an oil and gas lease to allow for operations under 43 CFR Part 3160 (see 43 CFR 3150.0-1).

In order to conduct geophysical operations on split estate lands where a federal oil and gas lease has been issued and where an agreement with the surface owner has not been reached, the lessee or the operator must first obtain BLM authorization through an NOI that proposes entry to those lands in order to conduct geophysical operations. The lessee or designated operator must provide to the BLM a certification that a good-faith effort was made to: (a) notify the landowner prior to entry; (b) obtain a Surface Access Agreement; and (c) deliver a copy of the proposed NOI to the surface owner.<sup>3</sup> The NOI must also identify the surface owner and include the owner's name, address, and telephone number, if known. A good and sufficient bond to secure payment of applicable damages for the use and benefit of the surface owner must be provided to the BLM on BLM Form 3160-19. The lessee or designated operator must also submit to the BLM evidence of service of a copy of the bond upon the surface owner. Prior to authorizing the NOI proposing entry to the lands for which the bond has been submitted, the BLM notifies the surface owner and provides a 30-day period during which the surface owner may protest the sufficiency of the bond. If the sufficiency of the bond is protested, the BLM reviews the bond amount and determines if it is adequate. That decision by the BLM is subject to State Director Review (SDR) upon a request by any adversely

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<sup>1</sup> *Onshore Oil and Gas Geophysical Exploration Surface Management Requirements*. January 9, 2007.

<sup>2</sup> *In BLM Washington Office Instruction Memorandum (IM) 2009-121, "Approval of Notice of Intent to Conduct Geophysical Exploration to Federal Oil and Gas Lessee on Split Estate", dated May 8, 2009, the BLM recognized that the Sundry Notice form (BLM Form 3160-5) is an imperfect form to use for permitting of geophysical operations. This policy clarified that the BLM will "no longer require the lessee or its operator to file a Sundry Notice" for the purpose of proposing entry to federal leases where a surface owner denies access to the lessee or its operator. In its place the BLM would use the NOI form (BLM Form 3150-4).*

<sup>3</sup> *See Onshore Oil and Gas Order No. 1, Part VI.*

affected party and the State Director's decision is subject to appeal to the Interior Board of Land Appeals (IBLA).<sup>4</sup>

## **D.4.2 Notice of Staking/Application for Permit to Drill**

### **Surveying and Staking Activities**

The lessee or operator is encouraged to contact the surface owner of split estate lands early in the process of planning for exploration and development of a federal lease. This facilitates early discussion about the goals and objectives of both the surface owner and operator. Communication between the lessee or operator and surface owner can reduce potential conflicts, thereby reducing misunderstandings and permit processing times.

For surveying and staking activities, “[t]he operator is responsible for making access arrangements with the appropriate Surface Managing Agency (other than the BLM and the Forest Service) or private surface owner” (Onshore Oil and Gas Order No. 1, part III.D.2.a).

“No entry on split estate lands for surveying and staking should occur without the operator first making a good faith effort to notify the surface owner. Also, operators are encouraged to notify the BLM or the Forest Service, as appropriate, before entering private lands to stake for Federal mineral estate locations” (Onshore Oil and Gas Order No. 1, part III.D.2.b).

Aside from surveying and staking the proposed well location, road, pipeline, and/or other lease facilities, the operator may also be required to conduct resource condition surveys of the leased lands.

“As provided in the oil and gas lease, the BLM may request that the applicant conduct surveys or otherwise provide information needed for the BLM's National Historic Preservation Act consultation with the State Historic Preservation Officer or Indian tribe or its Endangered Species Act consultation with the relevant fisheries agency. The Federal mineral lessee has the right to enter the property for this purpose, since it is a necessary prerequisite to development of the dominant mineral estate. Nevertheless, the lessee or operator should seek to reach agreement with the surface owner about the time and method by which any survey would be conducted” (Onshore Oil and Gas Order No. 1, part VI).

### **Onsite Inspection(s)**

On split estate lands, the onsite inspection provides the opportunity for the BLM, operator, and surface owner to evaluate and discuss the proposed well location or lease facility in the field.

“Within 10 days of receiving the application, the BLM, in coordination with the operator and Surface Managing Agency, including the private surface owner in the case of split estate minerals, will schedule a date for the onsite inspection (unless the onsite inspection has already been conducted as part of a Notice of Staking)” (Onshore Oil and Gas Order No. 1, part III.E.2.a).

“On Non-National Forest System lands, the BLM will invite the Surface Managing Agency and private surface owner, if applicable, to participate in the onsite inspection. If the surface is privately owned, the operator must furnish to the BLM the name, address, and telephone number of the surface owner if known” (Onshore Oil and Gas Order No. 1, part III.C).

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<sup>4</sup> See 43 CFR §3165.3(b). See, e.g., *William P. Maycock*, 176 IBLA 206 (2008).



At the onsite inspection, the BLM will consider applicable Best Management Practices (BMP) that would avoid or mitigate environmental impacts to natural resources. The onsite inspection provides the surface owner with the opportunity to review the proposed well location and/or lease facilities; provide information to the BLM and operator about resources, improvements, and land uses; and express preferences for BMPs to be used for lease operations.

“All parties who attend the onsite inspection will jointly develop a list of resource concerns that the operator must address in the application for permit to drill (APD). The operator will be provided a list of these concerns either during the onsite inspection or within 7 days of the onsite inspection. Surface owner concerns will be considered to the extent practical within the law” (Onshore Oil and Gas Order No. 1, part III.C).

“The BLM will invite the surface owner to the onsite inspection to assure that their concerns are considered” (Onshore Oil and Gas Order No. 1, part VI).

## **Required Components of a Complete Application for Permit to Drill for Split Estate Operations**

### **Description of Surface Ownership**

A description of the surface ownership (with name, address, and telephone number, if known) along with a certification must be included in the APD submitted by the operator to the BLM.

“The operator must indicate (in a narrative) the surface ownership at the well location, and of all lands crossed by roads that the operator plans to construct or upgrade, including, if known, the name of the agency or owner, phone number, and address. The operator must certify that they have provided a copy of the Surface Use Plan of Operations (SUPO) required in this section to the private surface owner of the well site location, if applicable, or that they made a good faith effort if unable to provide the document to the surface owner” (Onshore Oil and Gas Order No. 1, part III.D.4.k).

### **Surface Access Agreement or Waiver**

For operations on leased split estate lands, the operator must undertake a good faith effort to reach a Surface Access Agreement.

“[I]n the case of actual oil and gas operations, the operator must make a good faith effort to notify the private surface owner before entry and make a good faith effort to obtain a Surface Access Agreement from the surface owner... The Surface Access Agreement may include terms or conditions of use, be a waiver, or an agreement for compensation. The operator must certify to the BLM that: (1) It made a good faith effort to notify the surface owner before entry; and (2) That an agreement with the surface owner has been reached or that a good faith effort to reach an agreement failed” (Onshore Oil and Gas Order No. 1, part VI).

“The operator must make a good faith effort to provide a copy of their Surface Use Plan of Operations to the surface owner” (Onshore Oil and Gas Order No. 1, part VI). The operator must also provide a copy of any revisions to the SUPO to the surface owner. If required under Onshore Oil and Gas Order No. 6 (“Hydrogen Sulfide Operations”), the BLM requires the operator to provide a copy of the Public Protection Plan to the surface owner.

“The surface use agreement between the surface owner and the operator is confidential. However, the APD Surface Use Plan of Operations must contain sufficient detail about any aspects of the agreement necessary for National Environmental Policy Act of 1969 (NEPA) documentation and to determine that the operations

will be in compliance with laws, regulations, Onshore Orders, and agency policies” (The Gold Book, page 12).

“If the BLM’s requirements conflict with provisions in the Surface [Access] Agreement, the operator or surface owner should disclose that conflict at the onsite or to the BLM in writing, and the BLM should consider those conflicts in making its final decision” (BLM’s Split Estate Report to Congress at page 15). Thus, to the extent terms of the agreement may conflict with Conditions of Approval to the APD, the BLM should be made aware of those terms, so that they can be considered in the BLM’s final decision.

“The BLM does not review the Surface Use Agreement and does not enforce portions of the Surface Use Agreement that are not contained within the approved APD” (BLM’s Split Estate Report to Congress at page 17.)

### **Bonding In Lieu of a Surface Access Agreement or Waiver**

It is the preference of the BLM that the operator and surface owner reach a Surface Access Agreement. However, in those cases where an agreement is not reached, the BLM follows the procedural requirements in the BLM’s regulations and policies. A good and sufficient bond to secure payment of applicable damages for the use and benefit of the surface owner must be provided to the BLM on BLM Form 3160-19. The lessee or designated operator must also submit to the BLM evidence of service of a copy of the bond upon the surface owner. Prior to authorizing the APD proposing entry to the lands for which the bond has been submitted, the BLM notifies the surface owner and provides a 30-day period during which the surface owner may protest the sufficiency of the bond. If the sufficiency of the bond is protested, the BLM reviews the bond amount and determines if it is adequate. That decision by the BLM is subject to SDR upon a request by any adversely affected party and the State Director’s decision is subject to appeal to the IBLA.<sup>5</sup>

“If no agreement was reached with the surface owner, the operator must submit an adequate bond (minimum of \$1,000) to the BLM for the benefit of the surface owner sufficient to: (1) pay for loss or damages; or (2) as otherwise required by the specific statutory authority under which the surface was patented and the terms of the lease. Surface owners have the right to appeal the sufficiency of the bond. Before the approval of the APD, the BLM will make a good faith effort to contact the surface owner to assure that they understand their rights to appeal” (Onshore Oil and Gas Order No. 1, part VI).

“The bond amount will be reviewed by the BLM to assure that it is sufficient based on the appropriate law” (Preamble to Onshore Oil and Gas Order No. 1 revisions, 72 FR 10323, March 7, 2007).

If operations under an approved APD result in loss or damages that are compensable under the statutes by which the lands were patented, the surface owner may obtain judgment from a court of competent jurisdiction. The BLM will then release from the bond the amount ordered by the court to the surface owner.

### **Approval of the APD**

The BLM considers the views of the surface owner before approving the APD. The BLM must prepare an environmental record of review (43 CFR 3162.5-1(a)) to document its evaluation of potential resource impacts, including documentation of NEPA compliance.

“The BLM must comply with NEPA, the National Historic Preservation Act, the Endangered Species Act, and related Federal statutes when authorizing lease operations on split estate lands where the surface is not federally owned and the oil and gas is Federal. For split estate lands within Forest Service administrative

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<sup>5</sup> See 43 CFR §3165.3(b). See, e.g., *William P. Maycock*, 176 IBLA 206 (2008).

boundaries, the BLM has the lead responsibility, unless there is a local BLM/Forest Service agreement that gives the Forest Service this responsibility” (Onshore Oil and Gas Order No. 1, part VI).

“After the APD is approved the operator must make a good faith effort to provide a copy of the Conditions of Approval to the surface owner. The APD approval is not contingent upon delivery of a copy of the Conditions of Approval to the surface owner” (Onshore Oil and Gas Order No. 1, part VI).

### **D.4.3 Sundry Notices**

Operations proposed by Sundry Notice that will result in additional surface disturbance or re-disturbance of previously reclaimed areas require a SUPO.

“Prior to commencing any operation on the leasehold which will result in additional surface disturbance, other than those authorized under § 3162.3–1 or § 3162.3–2 of this title, the operator shall submit a proposal on Form 3160–5 to the Authorized Officer for approval. The proposal shall include a surface use plan of operations” (43 CFR 3162.3-3).

“The operator must certify on Form 3160–5 that they have made a good faith effort to provide a copy of any proposal involving new surface disturbance to the private surface owner in the case of split estate” (Onshore Oil and Gas Order No. 1, part VIII.A).

For review of Final Abandonment Notices submitted by an operator on split estate lands, the BLM will consider the views of the surface owner.

“If applicable, the private surface owner will be notified and their views will be carefully considered” (Onshore Oil and Gas Order No. 1, part XII).

“In cases where the Surface Managing Agency or private surface owner desires to acquire an oil and gas well and convert it to a water supply well or acquire a water supply well that was drilled by the operator to support lease operations, the Surface Managing Agency or private surface owner must inform the appropriate BLM office of its intent before the approval of the APD in the case of a dry hole and no later than the time a NOI to Abandon is submitted for a depleted production well... The Surface Managing Agency or private surface owner must reach agreement with the operator as to the satisfactory completion of reclamation operations before the BLM will approve any abandonment or reclamation. The BLM approval of the partial abandonment under this section, completion of any required reclamation operations, and the signed release agreement will relieve the operator of further obligation for the well. If the Surface Managing Agency or private surface owner acquires the well for water use purposes, the party acquiring the well assumes liability for the well” (Onshore Oil and Gas Order No. 1, part IX.B).

“Completion of a well as plugged and abandoned may also include conditioning the well as water supply source for lease operations or for use by the surface owner or appropriate Government Agency, when authorized by the Authorized Officer. All costs over and above the normal plugging and abandonment expense will be paid by the party accepting the water well” (43 CFR 3162.3-4(b)).

### **D.4.4 Emergency Operations**

“In the event of an emergency, the operator may take immediate action without prior Surface Managing Agency approval to safeguard life or to prevent significant environmental degradation. The BLM or the Forest Service must receive notification of the emergency situation and the remedial action taken by the operator as soon as possible, but not later than 24 hours after the emergency occurred. If the emergency only affected drilling operations and had no surface impacts, only the BLM must be notified. If the

emergency involved surface resources on other Surface Managing Agency lands, the operator should also notify the Surface Managing Agency and private surface owner within 24 hours” (Onshore Oil and Gas Order No. 1, Part IV.d).

## D.5 REFERENCES

- Onshore Oil and Gas Order No. 1.
- Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (“The Gold Book”).
- 43 CFR Part 3150.
- 43 CFR Part 3160.
- 43 CFR Subpart 3814.
- BLM Wyoming–Wyoming Oil and Gas Conservation Commission Memorandum of Understanding.
- BLM Handbook H-3150-1 (Geophysical Handbook).
- BLM Form 3160-019 (“Bond for Surface Owner Protection”).
- BLM Brochure: Split Estate–Rights, Responsibilities, and Opportunities.
- BLM Brochure: Split Estate–Cultural Resource Requirements on Private Surface–Federal Minerals for Oil and Gas Development.
- BLM-Washington Office Instruction Memorandum 2003-131 (“Permitting Oil and Gas on Split Estate Lands and Guidance for Onshore Oil and Gas Order No. 1”), April 2, 2003.
- BLM-Washington Office Instruction Memorandum 2007-165 (“Split Estate Report to Congress–Implementation of Fluid Mineral Leasing and Land Use Planning Recommendations”), July 26, 2007.
- Energy Policy Act of 2005, Section 1835 (“Split-Estate Federal Oil and Gas Leasing and Development Practices”).
- Energy Policy Act of 2005–Section 1835–A Report to Congress (December 2006).
- BLM-Washington Office Instruction Memorandum 1989-201 (“Legal Responsibilities of BLM for Oil and Gas Leasing and Operations on Split Estate Lands”), January 4, 1989.

# APPENDIX E— FEDERAL LAWS, REGULATIONS, AND POLICIES

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## E.1 ENVIRONMENTAL POLICY

### National Environmental Policy Act of 1969

NEPA (42 United States Code [USC] 4321 et seq.) requires the preparation of EISs for federal projects that may have a significant effect on the environment. It requires systematic, interdisciplinary planning to ensure the integrated use of the natural and social sciences, and the environmental design arts in making decisions about major federal actions that may have a significant effect on the environment. The procedures required under NEPA are implemented through the CEQ regulations in 40 CFR §1500.

### Federal Compliance with Pollution Control Standards (EO 12088)

Federal Compliance with Pollution Control Standards (EO 12088) states that federal agencies must comply with applicable pollution control standards.

### Protection and Enhancement of Environmental Quality (EO 11514)

Protection and Enhancement of Environmental Quality (EO 11514, as amended by EO 11991) establishes the policy for federal agencies to provide leadership in environmental protection and enhancement.

### Organic Administration Act of 1897

This Act authorizes the Secretary of Agriculture to issue rules and regulations for the occupancy and use of the National Forests. This is the basic authority for authorizing use of NFS lands for other than ROWs.

## E.2 LAND USE AND NATURAL RESOURCES MANAGEMENT

### Federal Land Policy and Management Act of 1976

The FLPMA, as amended (43 USC 1701, et seq.), provides for public lands to be generally retained in federal ownership for periodic and systematic inventory of the public lands and their resources; for a review of existing withdrawals and classifications; for establishment of comprehensive rules and regulations for administering public lands statutes; for multiple-use management on a sustained yield basis; for protection of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource and archeological values; for receiving fair market value for the use of the public lands and their resources; for establishment of uniform procedures for any disposal, acquisition or exchange; for identification and protection of areas of critical environmental concern; for recognition of the nation's need for domestic sources of minerals, food, timber and fiber from the public lands, including implementation of the Mining and Mineral Policy Act of 1970; and for payments to compensate states and local governments for burdens created as a result of the immunity of federal lands from state and local taxation. The general land management regulations are provided in 43 CFR §2000, Subchapter B.

## **The Forest and Rangelands Renewable Resources Planning Act of 1974**

This Act directs the Secretary of Agriculture to include, as appropriate, research activities when managing forest and rangeland resource, and to periodically assess the national situation of the forest and rangeland resources. This assessment is called the Renewable Planning Act assessment. See FSM 1906 and FSM 1910 for detailed requirements.

## **Taylor Grazing Act of 1934**

The Taylor Grazing Act of 1934, as amended (43 USC 315), provides authorization to the Secretary of the Interior to establish grazing districts from any part of the public domain of the United States (exclusive of Alaska) which, in the Secretary's opinion, are chiefly valuable for grazing and raising forage crops; to regulate and administer grazing use of the public lands; and to improve the public rangelands. Regulations for grazing permits are provided in 43 CFR §4100.

## **Public Rangelands Improvement Act of 1978**

The Public Rangelands Improvement Act of 1978 (43 USC 1901, et seq.) provides for the improvement of range conditions on public rangelands, research on wild horse and burro population dynamics, and other range management practices.

## **Federal Noxious Weed Act of 1974**

The Federal Noxious Weed Act of 1974, as amended (7 USC 2814), provides for the designation of a lead office and a person trained in the management of undesirable plants, establishment and funding of a management program for undesirable plants, completion and implementation of cooperative agreements with state agencies, and establishment of integrated management systems to control undesirable plant species.

## **Healthy Forests Restoration Act of 2003**

The Healthy Forests Restoration Act serves to further the Healthy Forests Initiative to reduce the threat of destructive wildfires while upholding environmental standards and encouraging early public input during review and planning processes. The Act strengthens public participation in developing high-priority forest health projects; reduces the complexity of environmental analysis, allowing federal land agencies to use the best science available to actively manage land under their protection; provides a more effective appeals process, encouraging early public participation in project planning; and issues clear guidance for court action against forest health projects.

## **Grazing Fees of 1986 (EO 12548)**

EO 12548 provides for establishment of appropriate fees for the grazing of domestic livestock on public rangelands and directs that the fee shall not be less than \$1.35 per animal unit month.

## **Wilderness Act of 1964**

The Wilderness Act of 1964 (16 USC 1131, et seq.) provides for the designation and preservation of wilderness areas.

### **Wild and Scenic Rivers Act of 1968, as amended (16 U.S.C. 1271-1287)**

This Act establishes the National Wild and Scenic Rivers System, designates the rivers included in the system, establishes policy for managing designated rivers, and prescribes a process for designating additions to the system.

### **Federal Land Exchange Facilitation Act of 1988**

The Federal Land Exchange Facilitation Act amended FLPMA with respect to BLM land exchanges. It was designed to streamline land exchange procedures.

### **Recreation and Public Purposes Act of 1926**

In 1954, the Congress enacted the Recreation and Public Purposes Act (43 USC 869 et. seq.) as a complete revision of the Recreation Act of 1926 in response to the public need for a nationwide system of parks and other recreational and public purposes areas. This law is administered by the BLM. The Act authorizes the sale or lease of public lands for recreational or public purposes to state and local governments and to qualified nonprofit organizations. Examples of typical uses under the Act are historic monument sites, campgrounds, schools, fire houses, law enforcement facilities, municipal facilities, landfills, hospitals, parks and fairgrounds.

### **National Trails System Act of 1968, as amended (16 U.S.C. 1241-1251)**

In order to provide for the ever-increasing outdoor recreation needs of an expanding population and in order to promote the preservation of public access to travel within, and for the enjoyment and appreciation of the open-air, outdoor areas and historic resources of the Nation, trails should be established (i) primarily, near the urban areas of the Nation, and (ii) secondarily, within scenic areas and along historic travel routes of the Nation, often more remotely located.

The purpose of this Act is to provide the means for attaining these objectives by instituting a national system of recreation, scenic and historic trails, by designating the Appalachian Trail and the Pacific Crest Trail as the initial components of that system, and by prescribing the methods by which, and standards according to which, additional components may be added to the system.

### **Airport and Airway Improvement Act of 1982**

The Airport and Airway Improvement Act established the Airport Improvement Program which provides grants to public agencies and, in some cases, to private owners and entities for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems.

### **Wyoming Range Legacy Act of 2009**

This Act established the Wyoming Range Withdrawal Area and affects all NFS lands and federal minerals in the identified withdrawal area located in the Bridger-Teton National Forest. The Act withdrew the area to: (1) all forms of appropriation or disposal under the public land laws; (2) location, entry and patent under the mining laws; and (3) disposition under laws relating to mineral and geothermal leasing.

## **E.3 AIR QUALITY**

### **The Clean Air Act of 1990**

The Clean Air Act of 1990, as amended (42 USC 7401, 7642), requires the BLM to protect air quality, maintain federal and state designated air quality standards, and abide by the requirements of the state implementation plans.

### **Wyoming Air Quality Standards and Regulations**

Wyoming air quality standards and regulations, Chapters 1 to 11, specify the requirements for air permitting and monitoring to implement Clean Air Act and state ambient air quality standards.

## **E.4 WATER QUALITY**

### **The Clean Water Act of 1987**

The Clean Water Act of 1987, as amended (33 USC 1251), establishes objectives to restore and maintain the chemical, physical and biological integrity of the Nation's water. The Act also requires permits for point source discharges to navigable waters of the United States and the protection of wetlands and includes monitoring and research provisions for protection of ambient water quality.

### **The Safe Drinking Water Act**

The Safe Drinking Water Act (SDWA) was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs and groundwater wells. SDWA authorizes the U.S. Environmental Protection Agency (EPA) to set national health-based standards for drinking water to protect against both naturally occurring and manmade contaminants that may be found in drinking water. The U.S. EPA, states and water systems work together to ensure that these standards are met.

### **Wyoming Water Quality Standards and Regulations**

Wyoming water quality standards and regulations implement permitting and monitoring requirements for the National Pollutant Discharge Elimination System, operation of injection wells, ground water protection requirements, prevention and response requirements for spills, and salinity standards and criteria for the Colorado River Basin.

### **Colorado River Salinity Control Act**

The 1974 Colorado River Basin Salinity Control Act, Public Law 93-320, authorizes the construction, operation and maintenance of works in the Colorado River Basin to control the salinity of water delivered to Mexico.

### **Protection of Wetlands (EO 11990)**

Protection of Wetlands (EO 11990) requires federal agencies to take action to minimize the destruction, loss or degradation of wetlands, and preserve and enhance the natural and beneficial values of wetlands.



## **Floodplain Management (EO 11988)**

Floodplain Management (EO 11988) provides for the restoration and preservation of national and beneficial floodplain values, and enhancement of the natural and beneficial values of wetlands in carrying out programs affecting land use.

## **E.5 MINERALS**

### **General Mining Law of 1872**

The General Mining Law of 1872, as amended (30 USC 22, et seq.), provides for locating and patenting mining claims where a discovery has been made for locatable minerals on public lands in specified states. Regulations for staking and maintenance of claims on BLM-administered lands are listed in 43 CFR §3800. Regulations for staking and maintenance of claims on NFS lands are listed in 36 CFR Part 228.

### **Mineral Leasing Act of 1920**

The Mineral Leasing Act of 1920, as amended (30 USC 181, et seq.), provides for the leasing of deposits of coal, phosphate, sodium, potassium, oil, oil shale, native asphalt, solid and semisolid bitumen, bituminous rock or gas, and lands containing such deposits owned by the United States, including those in national forests but excluding those acquired under other acts subsequent to February 25, 1920, and those lands within the national petroleum and oil shale reserves. Regulations for onshore oil and gas leasing are provided in 43 CFR §3100. Regulations concerning oil and gas leases on NFS lands are listed in 36 CFR Part 228.

### **Materials Act of 1947**

The Materials Act of 1947, as amended (30 USC 601–604, et seq.), provides for the sale of common variety materials for personal, commercial or industrial uses and for free use for local, state, and federal governmental entities. The sales of mineral materials are controlled by the regulations listed in 43 CFR §3600 and 36 CFR Part 228.

### **Common Varieties of Mineral Materials Act of 1947**

The Common Varieties of Mineral Materials Act of 1947 provides for the disposal of mineral materials on the public lands through bidding, negotiated contracts or free use.

### **Mineral Leasing Act for Acquired Lands of 1947**

The Mineral Leasing Act for Acquired Lands of 1947 states that all deposits of coal, phosphate, oil, oil shale, gas, sodium, potassium and sulfur that are owned, may be acquired, and are within lands acquired by the United States, may be leased by the Secretary of the Interior under the same conditions as contained in the leasing provisions of the mineral leasing laws. No mineral deposits shall be leased without the consent of the head of the executive department having jurisdiction over the lands containing the deposit and subject to such conditions as that official may prescribe.

### **Multiple Use Mining Act of 1955**

The Multiple Use Mining Act of 1955 allows the sale of mineral materials, such as sand and gravel, and provides direction for use of surface resources of mining claims.

## **Mining and Minerals Policy Act of 1970**

The Mining and Minerals Policy Act of 1970 states that the continuing policy of the federal government is to foster and encourage private enterprise in the development of economically sound and stable domestic mining and minerals industries and the orderly and economic development of domestic mineral resources.

## **Federal Coal Leasing Amendments Act of 1976**

The Federal Coal Leasing Amendments Act of 1976 (30 USC 201, et seq.) requires competitive leasing of coal on public lands and mandates a broad spectrum of coal operations requirements for lease management. Coal leasing regulations for BLM-administered and NFS lands are provided in 43 CFR §3400.

## **Federal Onshore Oil and Gas Leasing Reform Act of 1987**

The Federal Onshore Oil and Gas Leasing Reform Act of 1987 authorized the Secretary of Agriculture the opportunity to object to leasing NFS lands reserved from the public domain and to regulate surface disturbing activities conducted pursuant to any lease issued under this Act. The BLM may issue oil and gas leases on NFS lands reserved for the public domain unless the Forest Service objects to the leasing.

## **Energy Policy and Conservation Act of 2000**

The purposes of the Energy Policy and Conservation Act of 2000, as amended (42 USC 6217 et seq.), are to:

- Grant specific authority to the President to fulfill obligations of the United States under the international energy program,
- Provide for the creation of a Strategic Petroleum Reserve capable of reducing the impact of severe energy supply interruptions,
- Conserve energy supplies through energy conservation programs, and, where necessary, the regulation of certain energy uses,
- Provide for improved energy efficiency of motor vehicles, major appliances and certain other consumer products,
- Provide a means for verification of energy data to ensure the reliability of energy data,
- Conserve water by improving the water efficiency of certain plumbing products and appliances.

## **Actions to Expedite Energy-Related Projects (EO 13212)**

EO 13212 of May 18, 2001, directs the federal agencies to expedite their review of permits for energy-related projects while maintaining safety, public health and environmental protections.

## **Energy Policy Act of 2005**

The Energy Policy Act of 2005 requires the BLM and Forest Service to enter into a Memorandum of Understanding to establish joint BLM and Forest Service policies and procedures to managing oil and gas leasing and operational activities such that there is consistency in lease stipulations across jurisdictional boundaries.

## Bureau of Land Management Energy and Non-Energy Mineral Policy

This statement sets forth BLM policy for the management of energy and non-energy mineral resources (mineral resources) on public lands. It reflects the provisions of five important acts of Congress relating to mineral resources: the Domestic Minerals Program Extension Act of 1953; the Mining and Minerals Policy Act of 1970; the Federal Land Policy and Management Act of 1976; the National Materials and Minerals Policy, Research and Development Act of 1980; and the Energy Policy Act of 2005. This policy represents a commitment by the BLM to implement the requirements of these statutes consistent with BLM's other statutory obligations, as follows:

The Domestic Minerals Program Extension Act of 1953 states that each department and agency of the Federal Government charged with responsibilities concerning the discovery, development, production, and acquisition of strategic or critical minerals and metals shall undertake to decrease further, and to eliminate where possible, the dependency of the United States on overseas sources of supply of each such material.

The Mining and Minerals Policy Act of 1970 declares that it is the continuing policy of the Federal Government to foster and encourage private enterprise in the development of a stable domestic minerals industry and the orderly and economic development of domestic mineral resources. This act includes all minerals, including sand and gravel, geothermal, coal, oil and gas.

The Federal Land Policy and Management Act of 1976 reiterates that the 1970 Mining and Minerals Policy Act shall be implemented and directs that public lands be managed in a manner which recognizes the Nation's need for domestic sources of minerals and other resources.

The National Materials and Minerals Policy, Research and Development Act of 1980 requires the Secretary of the Interior to improve the quality of minerals data in Federal land use decision-making.

The Energy Policy Act of 2005 encourages energy efficiency and conservation; promotes alternative and renewable energy sources; reduces dependence on foreign sources of energy; increases domestic production; modernizes the electrical grid; and encourages the expansion of nuclear energy.

The BLM recognizes that public lands are an important source of the Nation's energy and non-energy mineral resources, some of which are critical and strategic. The BLM is responsible for making public lands available for orderly and efficient development of these resources under principles of multiple use and sustained yield, in accordance with FLPMA.

The following principles will guide the BLM in managing mineral resources on public lands:

Except for Congressional withdrawals, public lands shall remain open and available for mineral exploration and development unless withdrawal or other administrative actions are clearly justified in the national interest in accordance with the DOI Land Withdrawal Manual 603 DM 1, and BLM regulations at 43 CFR §2310. Petitions to the Secretary of the Interior for revocation of land withdrawals for mineral exploration and development will be evaluated through the land use planning process.

The BLM actively encourages development by private industry of public land mineral resources, and promotes practices and technology that least impact natural and human resources.

The BLM will adjudicate and process mineral patent applications, permits, operating plans, mineral exchanges, leases and other mineral use authorizations for public lands in a manner to prevent unnecessary or undue degradation, in a timely and efficient manner, and will require financial assurances to provide for reclamation of the land and for other purposes authorized by law. Mine closure and reclamation considerations include alternative forms of use such as for landfills, wind farms, biomass facilities and other industrial uses, to attract partnerships to utilize the existing mine infrastructure for a future economic opportunity.

The BLM land use planning and multiple-use management decisions will recognize that, with few exceptions, mineral exploration and development can occur concurrently or sequentially with other resource uses. The least restrictive stipulations that effectively accomplish the resource objectives or uses will be used. The BLM will coordinate with surface owners when the Federal minerals estate under their surface ownership is proposed for development.

Land use plans will reflect geological assessments and mineral potential on public lands through existing geology and mineral resource data, and to the extent feasible, through new mineral assessments to determine mineral potential. Partnerships with State Geologists and the U.S. Geological Survey for obtaining existing and new data should be considered.

The BLM will work closely with Federal, State and Tribal governments to reduce duplication of effort while processing mineral related permit applications.

The BLM will monitor locatable, salable and leasable mineral operations to ensure proper resource recovery and evaluation, production verification, diligence and enforcement of terms and conditions. The BLM will ensure receipt of fair market value for mineral materials, and appropriate royalty rates for leasable commodities unless otherwise provided for by statute.

The BLM will continue to develop e-Government solutions that will provide for electronic submission and tracking of applications for exploration and development of mineral resources. The BLM will continue to provide public access to mineral records, including spatial display of all types of authorizations and mineral resource data.

The BLM will maintain and enhance the understanding, skills, and abilities of effective professional, technical, and managerial personnel knowledgeable in adjudication, geology, mineral exploration and development.

To the extent provided by law, regulation, secretarial order, and written agreement with the Bureau of Indian Affairs, the BLM will apply the above principles to the management of mineral resources and operations on Indian Trust lands in order to comply with its Trust Responsibilities.

## **E.6 CULTURAL RESOURCES**

### **The Antiquities Act of 1906**

The Antiquities Act of 1906 (16 USC 431-433) protects objects of historic and scientific interest on public lands. It authorizes the President to designate historic landmarks and structures as national monuments and provides penalties for people who damage these historic sites. The Act has two main components: (1) a criminal enforcement component, which provides for the prosecution of persons who appropriate, excavate, injure or destroy any historic or prehistoric ruin or monument, or any object of antiquity on lands owned or controlled by the United States, and (2) a component that authorizes a permit for the examination of ruins

and archeological sites and the gathering of objects of antiquity on lands owned or controlled by the United States.

### **Historic Sites Act of 1935**

The Historic Sites Act (16 USC 461) declares national policy to identify and preserve historic sites, buildings, objects, and antiquities of national significance, thereby providing a foundation for the National Register of Historic Places (NRHP).

### **National Historic Preservation Act of 1966**

The National Historic Preservation Act of 1966 (NHPA), as amended (16 USC 470), expands protection of historic and archeological properties to include those of national, state, and local significance. The NHPA (in Section 106) requires federal agencies to take into account the potential effects of agency actions on properties listed on or eligible for the NRHP. Agencies are also required to consult with the State Historic Preservation Office (SHPO), and sometimes with the Advisory Council on Historic Preservation, concerning those effects. The SHPO is also sometimes consulted concerning applicable methods for determining whether there are NRHP-eligible properties in the area of potential effect of an agency undertaking, whether properties are eligible, and appropriate mitigation measures. The NHPA (in Section 110) also requires federal agencies to identify properties that may qualify for listing on the NRHP, to evaluate and nominate such places to the register, and to develop plans for their management. Section 110 of the NHPA requires federal agencies to develop proactive programs to interpret archeological resources for the benefit of the public. The 1992 amendments to the NHPA call for federal agencies to conduct Native American consultation on projects that may affect sites or resources that Tribes consider sensitive, sacred or culturally important.

### **Protection and Enhancement of the Cultural Environment of 1971 (EO 11593)**

Protection and Enhancement of the Cultural Environment directs federal agencies to locate, inventory, nominate and protect federally owned cultural resources eligible for the NRHP, and to ensure that their plans and programs contribute to preservation and enhancement of nonfederally owned resources.

### **American Indian Religious Freedom Act of 1978**

The American Indian Religious Freedom Act (42 USC 1996) clarifies U.S. policy pertaining to the protection of Native Americans' religious freedom. The special nature of Native American religions has frequently resulted in conflicts between federal laws and policies and religious freedom. The Act establishes a policy of protecting and preserving the inherent right of individual Native Americans (including American Indians, Eskimos, Aleuts, and Native Hawaiians) to believe, express and exercise their traditional religions.

### **Archeological Resources Protection Act of 1979**

The Archeological Resource Protection Act, as amended (16 USC 470a, 470cc, 470ee), requires permits for the excavation or removal of federally administered archeological resources, encourages increased cooperation among federal agencies and private individuals, provides stringent criminal and civil penalties for violations, and requires federal agencies to identify important resources vulnerable to looting and to develop a tracking system for violations. ARPA requires federal agencies to establish a program to increase public awareness of the significance of the archaeological resources located on public lands and Indian lands and the need to protect such resources.

## **Native American Graves Protection and Repatriation Act of 1990**

The Native American Graves Protection and Repatriation Act (25 USC 3001) is a federal law passed in 1990 that provides a process for museums and federal agencies to return certain Native American cultural items—human remains, funerary objects, sacred objects, and objects of cultural patrimony—to lineal descendants, culturally affiliated Native American tribes and Native Hawaiian organizations. It also addresses consultation with Native Americans for the excavation and/or removal of cultural items, and the discovery of cultural items made during land use activities.

The NAGPRA requires: 1) that Federal Agencies consult with tribes in regards to the repatriation of human remains and four types of cultural objects held in their collections; 2) that they consult with Native Americans in regards to the protection of burial sites on Federal land, both those known/suspected and those inadvertently discovered; 3) that the agency consults with Tribes on disposition/control of cultural items and human remains found on federal lands [25 USC 3002(a)]; 4) that Federal agencies will only allow excavation and removal of Native American items and human remains from Federal lands with a permit which is issued only after consultation with tribes [25 USC 3002(c)]; and 5) provides penalties for illegal trafficking [18 USC 1170].

## **Indian Sacred Sites (EO 13007)**

EO 13007, signed in 1996, requires each executive branch agency with statutory or administrative responsibility for the management of federal lands to accommodate access to and ceremonial use of Native American sacred sites by Native American religious practitioners and avoid adversely affecting the physical integrity of such sacred sites, whenever possible. Where appropriate, agencies shall maintain the confidentiality of sacred sites.

Indian Sacred Sites, as defined in Executive Order (EO) 13007, are “any specific, discrete, narrowly delineated location on federal land that is identified by an Indian tribe or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion.” Indian Sacred Sites are not always eligible for the NRHP; however, pursuant to the guidelines in EO 13007, they receive the same protective measures as NRHP-eligible historic properties. Indian Sacred Sites [EO 13007] also mandates that Federal agency permitted actions cannot block Tribal access to sacred sites. To protect traditional Native American cultural resources, the locations are often kept confidential and not released to the public (BLM 2003).

## **Consultation and Coordination with Indian Tribal Governments (EO 13175)**

EO 13175, signed in 2000, required federal agencies to establish regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates upon Indian tribes.

## **Trails for America in the 21st Century (EO 13195)**

EO 13195, signed in 2001, requires federal agencies, to the extent permitted by law and where practicable—and in cooperation with tribes, states, local governments and interested citizen groups—to protect, connect, promote and assist trails of all types throughout the United States.

## **Preserve America (EO 13287)**

EO 13287, signed in 2003, requires the Federal Government to lead the preservation of America's heritage by actively advancing the protection, enhancement, and contemporary use of the historic properties owned by the government and by promoting intergovernmental cooperation and partnerships for the preservation and use of historic properties.

## **E.7 HAZARDOUS MATERIALS**

### **Comprehensive Environmental Response, Compensation and Liability Act of 1980**

The Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (42 USC 9601–9673), provides for liability, risk assessment, compensation, emergency response and cleanup (including the cleanup of inactive sites) for hazardous substances. The Act requires federal agencies to report sites where hazardous wastes are or have been stored, treated, or disposed of and requires responsible parties, including federal agencies, to clean up releases of hazardous substances.

### **Resource Conservation and Recovery Act**

The Resource Conservation and Recovery Act, as amended by the Federal Facility Compliance Act of 1992 (42 USC 6901–6992), authorizes the U.S. EPA to manage, by regulation, hazardous wastes on active disposal operations. The Act waives sovereign immunity for federal agencies with respect to all federal, state and local solid and hazardous waste laws and regulations. Federal agencies are subject to civil and administrative penalties for violations and to cost assessments for the administration of the enforcement.

### **Emergency Planning and Community Right-to-Know Act of 1986**

The Emergency Planning and Community Right-to-Know Act of 1986 (42 USC 11001–11050) requires the private sector to inventory chemicals and chemical products, to report those in excess of threshold planning quantities, to inventory emergency response equipment, to provide annual reports and support to local and state emergency response organizations, and to maintain a liaison with the local and state emergency response organizations and the public.

## **E.8 PALEONTOLOGICAL RESOURCES**

### **Paleontological Resources Preservation Act (summarized)**

#### **Significance of the Law:**

This is the first legislation specifically addressing the management of paleontological resources on Federal lands. BLM's management of paleontological resources was primarily authorized under the Federal Land Policy and Management Act (FLPMA) of 1976, the National Environmental Protection Act (NEPA) of 1969, and a host of lesser laws prior to enactment of this legislation.

As most of these existing laws did not specifically address paleontological resources directly, management was based on phrases such as “protect...the quality of scientific...and other values” (FLPMA) or that “important historic, cultural and natural aspects of our national heritage...” should be protected (NEPA). This left words like “quality,” “scientific,” “important” and “natural aspects” open for interpretation, especially when dealing with issues of permitting requirements, theft, and mitigation; and these

interpretations differed among agencies. Additionally, the broader implications of management were not considered, such as hobby collecting, commercial sales of non-scientific fossils, and just how far our management of the resource could legally extend. These FLPMA and NEPA statements were also focused solely on ‘protection’ rather than overall ‘management,’ therefore leaving unaddressed the opportunities for public interpretation, research, educational activities or other proactive efforts.

A Federal law addressing paleontological resources on Federal lands will eliminate or reduce most of these concerns. It will also recognize that paleontological resources are a legitimate, important resource that should be managed; beyond the vague ‘protect important public values’ principles. The mandates in the Paleontological Resources Preservation Act (PRPA) are actually quite similar to BLM’s current management policies and practices, therefore little shift in our present approaches will result. However, this now gives us firm, clear direction - with the weight of law - to manage in this manner.

In summation, most of our management of paleontological resources has been based on our interpretations of indirect legislation, regulations, and policies, therefore it’s been somewhat tenuous and subject to questioning. This Act will now provide us with firm legislative footing to properly manage all aspects of this resource.

#### **Management Issues:**

This law states that casual (hobby) collection of fossils will be allowed; limited to reasonable amounts of common invertebrate and plant fossils, for non-commercial personal use. BLM did allow hobby collection of common invertebrate and plant fossils previously, but this was authorized under regulation and therefore was potentially subject to change at any time.

There will now be stricter penalties for unlawful collection of paleontological resources. Because paleontological resources were not specifically identified in other laws, which would then bring them under any penalty sections those laws may contain, it was always difficult to charge offenders with anything more stringent than theft of government property and a \$500 fine, plus damages. Many of the more complete dinosaur skeletons sell for \$50,000 to several million dollars, so a \$500 fine was inconsequential and of little deterrent. The PRPA includes criminal and civil penalties for theft of paleontological resources, with possible penalties including up to five years in jail, and fines based on market or scientific value, costs of restoration, and any other factors considered relevant by the agency. Multiple offenses can be assessed for double the amount.

We will also have better consistency between agencies. This has not been a major issue; as most land managing agencies were similar in their overall approach, especially in recent years. But, there were a number of inconsistencies in the details of management approaches – the USGS, for example, has wanted to make specific locality data available to the public (primarily researchers) through written publications or web sites, but the BLM and other agencies treat this information as proprietary, and even exempt it from FOIA requests.

#### **Significant points and details:**

Although many of these points reflect current policy, these now carry the weight of law, rather than regulations, policy statements, Instruction Memoranda or simple guidance; all subject to agency modification.

- Casual collecting is defined as “the collecting of a reasonable amount of common invertebrate and plant paleontological resources for non-commercial personal use...resulting in only negligible disturbance to the Earth’s surface and other resources.” It’s further stated that “the terms



‘reasonable amount’, ‘common invertebrate and plant paleontological resources’ and ‘negligible disturbance’ shall be determined by the Secretary.”

- Paleontological Resource is defined as “any fossilized remains, traces, or imprints of organisms, preserved in or on the earth’s crust, that are of paleontological interest and that provide information about the history of life on earth...” and goes on to specifically exclude archeological and cultural (human graves, mostly) resources. Sec. 6301
- “The Secretary shall manage and protect paleontological resources on Federal land using scientific principles and expertise.” Sec. 6302 (a)
- Permits are required for collecting of paleontological resources, except:
- “The Secretary shall allow casual collecting without a permit...” on BLM, BOR, and National Forest System lands, consistent with other laws and policies. Sec. 6304 (a)(1) and (2)
- Criteria for issuance of a permit include: the applicant is qualified; the activity is undertaken to further paleontological knowledge or for public education; the activity is consistent with any management plans; the methods of collecting will not threaten significant natural or cultural resources. Sec. 6304 (b)
- Permits will contain such terms and conditions as necessary, and shall include requirements that: fossils collected from public lands remain the property of the United States; the paleontological resources and copies of associated records will be preserved in an approved repository; specific locality data will not be released by the permittee or repository without the written permission of the Secretary. Sec. 6304 (c)
- Areas may be closed to collecting or access restricted to protect paleontological resources. Sec. 6304 (e)
- Prohibited Acts include: trafficking or offering to traffic in paleontological resources, if the person knew or should have known they were illegally collected from public lands; sell or purchase, or offer for sale or purchase, any paleontological resource, if the person knew or should have known they were illegally collected from public lands. Sec. 6306 (a)
- No false labeling. Includes false records, accounts and identifications. Sec. 6306 (b)
- This would mean intentional false labeling; not honest mistakes or preliminary identifications.
- Penalties include fines based on value of the fossils and up to five years in jail; second or subsequent violations may result in doubling the penalties. Sec. 6306 (c)
- Amount of penalties should consider: the scientific or fair market value of the paleontological resource; the cost of restoration and repair of the resource and the locality; any other factors considered relevant by the agency. Sec. 6307 (a)
- Penalties collected can be used only to: protect, restore, or repair the paleontological resources and the sites they came from; provide educational materials to the public; payment of rewards. Sec. 6307 (d). Penalty fees do not go into the general fund or any other fund or activity.
- Rewards are authorized for furnishing information which leads to a conviction or violation, up to 1/2 the penalties assessed. Sec. 6308 (a)
- All paleontological resources associated with a violation or conviction is subject to forfeiture. Sec. 6308 (b) (the final legislation eliminated the draft provision that would have allowed seizure of equipment and vehicles used in connection with the violation)
- Seized paleontological resources may be transferred to Federal or non-Federal educational institutions. Sec. 6308 (c) (Will probably be limited to approved repositories)

- Information concerning the nature and specific location of a paleontological resource shall be exempt from FOIA, with a few key exemptions. Sec. 6309
- This law does not apply to, or require a permit for, casual collecting of a rock or mineral. Sec. 6311 (3)
- This law does not affect any land other than Federal land or affect the lawful collection or sale of paleontological resources from land other than Federal land. Sec. 6311 (4)
- (These last two points are in contrast to much of the misinformation that was circulating among rock club websites and other communications prior to passage).

**Next Steps:**

The BLM (and other agencies) will develop formal regulations that will expand on these points, create the additional details needed for implementation, and assure consistency with all other laws, regulations, and policies. Because of the mandate for the DOI and DOA to coordinate (Sec. 6302 (b)), regulations may be cooperatively developed, to result in Uniform Regulations. Whether all the regulations will be developed in this manner, or whether some will be done within a specific agency, is unknown at this time. Uniform Regulations will probably be written initially by interagency paleontology staff, followed by reviews at each agency. For the BLM, this review will include all paleontology staff, other resource staff, the BLM solicitors (lawyers) and agency management people. At this time, time frames and procedures for this process have not been determined. It is expected that implementation of the provisions of the law will be accomplished in stages, with some PRPA sections enacted with little or no regulations needed, while other sections may not be fully implemented for several years.

## **E.9 WILDLIFE AND FISHERIES**

### **Endangered Species Act of 1973**

The purpose of the Endangered Species Act (ESA) is to protect and recover imperiled species and the ecosystems upon which they depend. It is administered by the USDI's USFWS and the Department of Commerce's National Marine Fisheries Service (NMFS). The USFWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine species such as salmon and whales.

### **Bald and Golden Eagle Protection Act**

The Bald Eagle Protection Act (16 USC 668) prohibits the take, possession, sale, purchase, barter, offer to sell, purchase, transport, export or import, of any bald eagle, alive or dead, or any part, nest, or egg thereof. "Take" includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb (50 CFR §22.3).

### **Fish and Wildlife Coordination Act**

The Act of March 10, 1934, (16 USC 661 et seq.) as amended, authorizes the Secretaries of Agriculture and Commerce to provide assistance to and cooperate with federal and state agencies to protect, rear, stock, and increase the supply of game and fur-bearing animals, as well as to study the effects of domestic sewage, trade wastes, and other polluting substances on wildlife. The Act also directs the Bureau of Fisheries to use impounded waters for fish-culture stations and migratory-bird resting and nesting areas and requires consultation with the Bureau of Fisheries before the construction of any new dams to provide for fish migration. In addition, the Act authorizes the preparation of plans to protect wildlife resources, the

completion of wildlife surveys on public lands, and the acceptance by the federal agencies of funds or lands for related purposes provided that land donations receive the consent of the state in which they are located.

The amendments enacted in 1946 require consultation with the USFWS and the fish and wildlife agencies of states where the “waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted...or otherwise controlled or modified” by any agency under a federal permit or license. Consultation is to be undertaken for the purpose of “preventing loss of and damage to wildlife resources.”

### **Fish and Wildlife Improvement Act of 1978**

The Fish and Wildlife Improvement Act of 1978 (16 USC 7421; 92 Stat. 3110), Public Law 95-616, authorizes the Secretaries of the Interior and Commerce to establish, conduct, and assist with national training programs for state fish and wildlife law enforcement personnel. It also authorized funding for research and development of new or improved methods to support fish and wildlife law enforcement. The law provides authority to the Secretaries to enter into law enforcement cooperative agreements with state or other federal agencies and authorizes the disposal of abandoned or forfeited items under the fish, wildlife, and plant jurisdictions of these Secretaries. Public Law 105-328, signed October 30, 1998, amended the Act to allow the USFWS to use the proceeds from the disposal of abandoned items derived from fish, wildlife, and plants to cover the costs of shipping, storing and disposing of those items.

### **Fish and Wildlife Conservation Act of 1980**

The Fish and Wildlife Conservation Act (USC 2901–2911), commonly known as the Nongame Act, encourages states to develop conservation plans for nongame fish and wildlife of ecological, educational, aesthetic, cultural, recreational, economic or scientific value. The states may be reimbursed for a percentage of the costs of developing, revising, or implementing conservation plans approved by the Secretary of the Interior. Amendments adopted in 1988 and 1989 directed the Secretary to undertake research and conservation activities for migratory nongame birds.

### **Migratory Bird Treaty Act of 1918 and EO 13186**

The Migratory Bird Treaty Act (16 USC 703–712. § 703) makes taking, killing, or possessing migratory birds unlawful. It shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or eggs of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof, included in the terms of the conventions between the United States and Great Britain for the protection of migratory birds concluded August 16, 1916 (39 Stat. 1702); the United States and the United Mexican States for the protection of migratory birds and game mammals concluded February 7, 1936; the United States and the Government of Japan for the protection of migratory birds and birds in danger of extinction, and their environment concluded March 4, 1972 [1]; and the convention between the United States and the Union of Soviet Socialist Republics for the conservation of migratory birds and their environments concluded November 19, 1976 (50 CFR §10.12). Under Executive Order 13186, federal agencies are responsible for implementing the provisions of the Migratory Bird Treaty Act by promoting conservation principles and management practices into agency activities. Federal agencies must ensure that federal actions are evaluated for potential impacts on migratory birds.

## Sikes Act of 1960

The Sikes Act (16 USC 670a–670o, 74 Stat. 1052), as amended, Public Law 86-797, approved September 15, 1960, provides for cooperation by the Departments of the Interior and Defense with state agencies in planning, development, and maintenance of fish and wildlife resources on military reservations throughout the United States. Key amendments to the Act that affect this EIS are highlighted below:

- An amendment enacted August 8, 1968 (Public Law 90-465, 82 Stat. 661), authorized a program for development of outdoor recreation facilities.
- Public Law 93-452, signed October 18, 1974 (88 Stat. 1369), authorized conservation and rehabilitation programs on Department of Energy (DOE), National Aeronautics and Space Administration (NASA), Forest Service, and BLM lands. These programs are carried out in cooperation with the states by the Secretary of the Interior and on Forest Service lands by the Secretary of Agriculture.
- Public Law 97-396, approved December 31, 1982 (96 Stat. 2005), provided for the inclusion of endangered plants in conservation programs developed for BLM, Forest Service, NASA, and DOE lands.
- Public Law 105-85, approved November 18, 1997 (11 Stat. 2017, 2018, 2020, 2022), added that each integrated natural resources management plan (INRMP) prepared under this act should provide for the sustainable use by the public of natural resources, to the extent that the use is not inconsistent with the needs of fish and wildlife resources. Public Law 105-85 also requires that the Secretary of the Interior, in consultation with state fish and wildlife agencies, submit a report annually on the amounts expended by the USDI and state fish and wildlife agencies on activities conducted pursuant to INRMPs to respective congressional committees with oversight responsibilities.

## Federal Cave Resources Protection Act of 1988

The purpose of the Federal Cave Resources Protection Act (16 USC 63) is to secure, protect and preserve significant caves on federal lands for the perpetual use, enjoyment, and benefit of all people and to foster increased cooperation and exchange of information between governmental authorities and those who use caves located on federal lands for scientific, education, or recreational purposes.

## E.10 WILD HORSES

### Wild Free Roaming Horse and Burro Act of 1971

The Wild Free Roaming Horse and Burro Act of 1971 provides for the management, protection and control of wild horses and burros on public lands and authorizes “adoption” of wild horses and burros by private individuals. Regulations applicable to wild horse and burro management on BLM-administered lands are provided in 43 CFR §4700.

## E.11 OTHER POLICY

### Regional Mitigation Strategies – Managing Large-scale Projects

Regional Mitigation Strategies are an effective tool for involving stakeholders in planning and efficiently managing Greater Sage-Grouse mitigation on a regional or landscape-level basis where the BLM anticipates large-scale projects and intensive, new development. The intent of Regional Mitigation Strategies, beyond fulfilling the concepts identified in §1.6(B)(1) includes the following:

- Increasing permitting efficiency and financial predictability for applicants by preplanning mitigation needs; and
- Enhancing the ability of Federal and State governments, Tribes, nongovernmental organizations, and resource users to invest in larger scale mitigation efforts through prioritization of investments and pooling of financial resources.

Regional Mitigation Strategies should include the following elements:

- A transparent stakeholder engagement process;
- A description of regional baseline conditions against which unavoidable impacts are assessed;
- The establishment and prioritization of regional mitigation objectives;
- The establishment of a method for calculating mitigation fees for unavoidable adverse impacts that warrant mitigation;
- The evaluation of appropriate mitigation sites, projects and/or measures;
- The identification and establishment of a structure to hold and apply mitigation investment funds; and
- The development of long-term monitoring and adaptive management requirements to evaluate and maximize the effectiveness of mitigation projects and measures.

A CCAA is a voluntary agreement whereby landowners agree to manage their lands to remove or reduce threats to species at risk of being listed under the ESA. In return for managing their lands to the benefit of a species at risk, landowners receive assurances against additional regulatory requirements should that species ever be listed under the ESA. Under a CCAA, the USFWS will issue enrolled landowners Enhancement of Survival permits pursuant to section 10(a)(1)(A) of the ESA for a period of 20 years. Since the agreement is voluntary, the landowner can end it at any point, although in doing so they would give up any assurances. Permits would be issued to participating landowners contingent on development of a site-specific sage-grouse conservation plan that is consistent with this CCAA.

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## APPENDIX F—PREDATOR MANAGEMENT

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### F.1 INTRODUCTION

The U.S. Department of the Interior, Bureau of Land Management (BLM) will implement strategies and techniques in land management decisions that minimize the threat predators pose. The land management agencies will also support and encourage other landowners and agencies in their efforts to minimize impacts from predators where needs have been documented.

### F.2 REQUIRED DESIGN FEATURES RELATIVE TO PREDATORS IN LAND MANAGEMENT DECISIONS

Project proponents are encouraged to include all appropriate conservation measures in their proposals. The BLM will require application of all appropriate conservation measures, warranted by site-specific analysis, in order to avoid, minimize, rectify, reduce, or compensate for impacts. Conservation measures not included in project proposals and determined appropriate from the site-specific analysis will be required as Conditions of Approval (COA), stipulations, terms and conditions, etcetera. Additional COAs developed through consultation with other federal, state, and local regulatory and resource agencies may be applied when supported by site-specific analysis.

Required Design Features include but are not limited to the following:

- Prohibit open dumps
- Require appropriate disposal of animal carcasses
- Construct or modify vertical structures in a manner that prevents nesting or perching by scavengers or raptors
- Require raptor perch deterrents on power poles as a component of permit issuance or renewal according to Avian Power Line Interaction Committee (APLIC) 2012 standards (*APLIC 2012. Suggested Practices for Raptor Protection on Power Lines and Mitigating Bird Collisions with Power Lines*. <http://aplic.org>)
- Remove vertical structures, such as utility poles, buildings, or windmills, where feasible and where these structures are either no longer necessary or operational
- Minimize creation of new roads
- Remove roads, unimproved roads, two-tracks, and restore sagebrush habitat
- Dispose of all garbage in containers that cannot be opened by animals
- Inventory and monitor predator populations by project proponents
- Identify and replace operational windmills with solar pumps.

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Allotment Name	Allotment #	Wyoming Land Health Standards*						Significant Causal Factors if Land Health Standard(s) Not Achieved
		1 Soil Conditions	2 Riparian Habitat	3 Upland Vegetation	4 Habitat Conditions	5 Water Quality	6 Air Quality	
Crookston Ranch	WY03215	Meeting	Meeting	Meeting	Meeting	Unknown	Unknown	
Dead Ox	WY13110	Meeting	Meeting	Meeting	Meeting	Unknown	Unknown	
Dewey Place	WY13106	Meeting	Meeting	Meeting	Meeting	Unknown	Meeting	
Donohoo	WY04016	Meeting	Meeting	Meeting	Meeting	Meeting	Meeting	
Eaton Place	WY13103	Meeting	Meeting	Meeting	Meeting	Unknown	Unknown	
Eden Project	WY03028	Unevaluated	Unevaluated	Unevaluated	Unevaluated	Unevaluated	Unevaluated	
Eighteen Mile	WY13017	Meeting	Not Meeting	Meeting	Meeting	Unknown	Unknown	<ul style="list-style-type: none"> <li>• Private Land Practices</li> <li>• Upstream Dam</li> </ul>
Erramouspe	WY13105	Meeting	Not Meeting	Meeting	Meeting	Unknown	Meeting	<ul style="list-style-type: none"> <li>• Livestock Use</li> <li>• Private Land Practices</li> </ul>
Figure Four	WY13023	Meeting	Meeting	Meeting	Meeting	Unknown	Meeting	
Fish Creek	WY13009	Meeting	Not Meeting	Meeting	Meeting	Unknown	Unknown	<ul style="list-style-type: none"> <li>• Livestock Use</li> </ul>
Fourth of July	WY03016	Meeting	Meeting	Meeting	Meeting	Unknown	Unknown	
Gold Creek	WY03000	Meeting	Not Meeting	Meeting	Meeting	Meeting	Meeting	<ul style="list-style-type: none"> <li>• Livestock Use</li> </ul>
Grass Creek	WY03204	Meeting	Meeting	Meeting	Meeting	Unknown	Unknown	
Hanks	WY04019	Meeting	Not Meeting	Meeting	Meeting	Meeting	Meeting	<ul style="list-style-type: none"> <li>• Livestock Use</li> </ul>
Hay Meadow	WY03307	Meeting	Not Meeting	Meeting	Meeting	Unknown	Meeting	<ul style="list-style-type: none"> <li>• Livestock Use</li> <li>• Irrigation Practices</li> </ul>
Hickey Mountain	WY04013	Meeting	Not Meeting	Meeting	Meeting	Meeting	Meeting	<ul style="list-style-type: none"> <li>• Livestock Use</li> <li>• Mineral Development</li> <li>• Upstream Conditions</li> </ul>
Highway-Gasson	WY13025	Meeting	Not Meeting	Meeting	Meeting	Unknown	Unknown	<ul style="list-style-type: none"> <li>• Upstream Dam</li> </ul>
Hisey Hollow	WY04020	Meeting	Meeting	Meeting	Meeting	Meeting	Meeting	
Horseshoe Wash	WY04006	Meeting	Meeting	Meeting	Meeting	Meeting	Meeting	
Houghton	WY13115	Meeting	Meeting	Meeting	Meeting	Unknown	Unknown	
Jack Ranch	WY13100	Meeting	Meeting	Meeting	Meeting	Meeting	Meeting	
Jensen Meadows	WY03303	Unevaluated	Unevaluated	Unevaluated	Unevaluated	Unevaluated	Unevaluated	
Johnson Place	WY03214	Meeting	Meeting	Meeting	Meeting	Unknown	Unknown	
Juel Place	WY03202	Meeting	Meeting	Meeting	Meeting	Unknown	Unknown	

Allotment Name	Allotment #	Wyoming Land Health Standards*						Significant Causal Factors if Land Health Standard(s) Not Achieved
		1 Soil Conditions	2 Riparian Habitat	3 Upland Vegetation	4 Habitat Conditions	5 Water Quality	6 Air Quality	
Larsen	WY04014	Meeting	Meeting	Meeting	Meeting	Meeting	Meeting	
Little Prospect	WY13002	Meeting	Not Meeting	Meeting	Meeting	Unknown	Unknown	<ul style="list-style-type: none"> <li>• Private Land Practices</li> <li>• Irrigation Practices</li> </ul>
Little Sandy	WY13003	Meeting	Not Meeting	Meeting	Meeting	Unknown	Unknown	<ul style="list-style-type: none"> <li>• Livestock Use</li> </ul>
Lombard	WY13022	Unevaluated	Unevaluated	Unevaluated	Unevaluated	Unevaluated	Unevaluated	
Long Draw	WY13104	Meeting	Meeting	Meeting	Meeting	Unknown	Unknown	
Mack Flat	WY13021	Meeting	Meeting	Meeting	Meeting	Unknown	Unknown	
McCann Ranch	WY13102	Unevaluated	Unevaluated	Unevaluated	Unevaluated	Unevaluated	Unevaluated	
Mellor Mountain	WY04027	Meeting	Not Meeting	Meeting	Meeting	Unknown	Unknown	<ul style="list-style-type: none"> <li>• Historic Livestock Use</li> <li>• Private Land Practices</li> <li>• Upstream Conditions</li> <li>• Roads</li> <li>• Irrigation Practices</li> </ul>
Middle Hay Place	WY13107	Meeting	Meeting	Meeting	Meeting	Unknown	Meeting	
Pacific Creek	WY13007	Not Meeting	Not Meeting	Meeting	Meeting	Unknown	Unknown	<ul style="list-style-type: none"> <li>• Livestock Use</li> <li>• Irrigation Practices</li> </ul>
Peoples Canal	WY04026	Meeting	Not Meeting	Meeting	Meeting	Unknown	Unknown	<ul style="list-style-type: none"> <li>• Irrigation Practices</li> </ul>
Pine Creek	WY13010	Meeting	Not Meeting	Meeting	Meeting	Unknown	Unknown	<ul style="list-style-type: none"> <li>• Livestock Use</li> </ul>
Pine Mountain	WY04007	Meeting	Not Meeting	Meeting	Meeting	Unknown	Unknown	<ul style="list-style-type: none"> <li>• Livestock Use</li> <li>• Upstream Conditions</li> <li>• Irrigation Practices</li> </ul>
Poison Creek	WY04017	Meeting	Meeting	Meeting	Meeting	Meeting	Meeting	
Poston	WY13005	Meeting	Meeting	Meeting	Meeting	Unknown	Meeting	
Prospect Mountain	WY13004	Meeting	Meeting	Not Meeting	Meeting	Unknown	Unknown	<ul style="list-style-type: none"> <li>• Livestock Use</li> </ul>
Pulley Place	WY03206	Meeting	Meeting	Meeting	Meeting	Unknown	Meeting	
Red Creek	WY04008	Meeting	Not Meeting	Meeting	Meeting	Unknown	Unknown	<ul style="list-style-type: none"> <li>• Historic Livestock</li> </ul>

Allotment Name	Allotment #	Wyoming Land Health Standards*						Significant Causal Factors if Land Health Standard(s) Not Achieved
		1 Soil Conditions	2 Riparian Habitat	3 Upland Vegetation	4 Habitat Conditions	5 Water Quality	6 Air Quality	
								Use
Red Desert Reservoir	WY13012	Meeting	Meeting	Meeting	Meeting	Unknown	Unknown	
Rife	WY13006	Meeting	Meeting	Meeting	Meeting	Unknown	Meeting	
Rock Springs	WY04002	Meeting	Meeting	Meeting	Meeting	Unknown	Unknown	
Sage	WY13018	Unevaluated	Unevaluated	Unevaluated	Unevaluated	Unevaluated	Unevaluated	
Sage Creek Mountain	WY04024	Meeting	Not Meeting	Meeting	Meeting	Meeting	Meeting	<ul style="list-style-type: none"> <li>• Livestock Use</li> </ul>
Salt Wells	WY03200	Meeting	Not Meeting	Meeting	Meeting	Meeting	Meeting	<ul style="list-style-type: none"> <li>• Livestock Use</li> <li>• Upstream Conditions</li> <li>• Irrigation Practices</li> </ul>
Sands	WY04009	Meeting	Not Meeting	Meeting	Meeting	Unknown	Unknown	<ul style="list-style-type: none"> <li>• Livestock Use</li> <li>• Irrigation Practices</li> <li>• Upstream Conditions</li> </ul>
Sandy Pasture	WY13015	Meeting	Meeting	Meeting	Meeting	Unknown	Unknown	
Spicer Group	WY13019	Meeting	Meeting	Meeting	Meeting	Unknown	Unknown	
Spring Creek	WY03203	Meeting	Meeting	Meeting	Meeting	Unknown	Unknown	
Stag Hollow	WY04011	Unevaluated	Unevaluated	Unevaluated	Unevaluated	Unevaluated	Unevaluated	
Steamboat Mountain	WY04015	Meeting	Meeting	Meeting	Meeting	Meeting	Meeting	
Sublette	WY13014	Meeting	Not Meeting	Meeting	Meeting	Unknown	Unknown	<ul style="list-style-type: none"> <li>• Historic Livestock Use</li> <li>• Private Land Practices</li> </ul>
Sugarloaf	WY13027	Meeting	Meeting	Meeting	Meeting	Unknown	Meeting	
Sweetwater	WY04010	Meeting	Not Meeting	Meeting	Meeting	Unknown	Unknown	<ul style="list-style-type: none"> <li>• Invasive Species</li> <li>• Historic Livestock Use</li> <li>• Wildlife Use</li> <li>• Wildfire</li> </ul>
Upper White Acorn	WY13109	Meeting	Meeting	Meeting	Meeting	Unknown	Unknown	
Vermillion Creek	WY13101	Unevaluated	Unevaluated	Unevaluated	Unevaluated	Unevaluated	Unevaluated	
	WY04003	Meeting	Not Meeting	Meeting	Meeting	Unknown	Unknown	<ul style="list-style-type: none"> <li>• Invasive Species</li> </ul>

Allotment Name	Allotment #	Wyoming Land Health Standards*						Significant Causal Factors if Land Health Standard(s) Not Achieved
		1 Soil Conditions	2 Riparian Habitat	3 Upland Vegetation	4 Habitat Conditions	5 Water Quality	6 Air Quality	
								• Upstream Conditions
White Acorn	WY13001	Meeting	Meeting	Meeting	Meeting	Unknown	Unknown	

\*See Section G.2 for a detailed description of the Wyoming Land Health Standards.



## **G.2 - STANDARDS FOR HEALTHY RANGELANDS AND GUIDELINES FOR LIVESTOCK GRAZING MANAGEMENT FOR PUBLIC LANDS ADMINISTERED BY THE BUREAU OF LAND MANAGEMENT IN THE STATE OF WYOMING**

**AUGUST 12, 1997**

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### **INTRODUCTION**

According to the Department of the Interior's final rule for grazing administration, effective August 21, 1995, the Wyoming Bureau of Land Management (BLM) State Director is responsible for the development of standards for healthy rangelands and guidelines for livestock grazing management on 18 million acres of Wyoming's public rangelands. The development and application of these standards and guidelines are to achieve the four fundamentals of rangeland health outlined in the grazing regulations (43 Code of Federal Regulations [CFR] 4180.1). Those four fundamentals are: 1) watersheds are functioning properly; 2) water, nutrients, and energy are cycling properly; 3) water quality meets state standards; and 4) habitat for special status species is protected.

Standards address the health, productivity, and sustainability of the BLM-administered public rangelands and represent the minimum acceptable conditions for the public rangelands. The standards apply to all resource uses on public lands. Their application will be determined as use-specific guidelines are developed. Standards are synonymous with goals and are observed on a landscape scale. They describe healthy rangelands rather than important rangeland by-products. The achievement of a standard is determined by measuring appropriate indicators. An indicator is a component of a system whose characteristics (e.g., presence, absence, quantity, and distribution) can be measured based on sound scientific principles.

Guidelines provide for and guide the development and implementation of reasonable, responsible, and cost-effective management practices at the grazing allotment and watershed level. The guidelines in this document apply specifically to livestock grazing management practices on BLM-administered public lands. These management practices will either maintain existing desirable conditions or move rangelands toward statewide standards within reasonable timeframes. Appropriate guidelines will ensure that the resultant management practices reflect the potential for the watershed, consider other uses and natural influences, and balance resource goals with social, cultural/historic, and economic opportunities to sustain viable local communities. Guidelines, like standards, apply statewide.

Implementation of the Wyoming standards and guidelines will generally be done in the following manner:

- Grazing allotments or groups of allotments in a watershed will be reviewed based on the BLM's current allotment categorization and prioritization process.
- Allotments with existing management plans and high-priority allotments will be reviewed first.

- Lower priority allotments will then be reviewed as time allows or when it becomes necessary for BLM to review the permit/lease for other reasons such as permit/lease transfers, permittee/lessee requests for change in use, etc.
- The permittees and interested publics will be notified when allotments are scheduled for review and encouraged to participate in the review.
- The review will first determine if an allotment meets each of the six standards.
- If it does, no further action will be necessary.
- If any of the standards aren't being met, rationale explaining the contributing factors will be prepared.
- If livestock grazing practices are found to be among the contributing factors, corrective actions consistent with the guidelines will be developed and implemented before the next grazing season in accordance with 43 CFR 4180.
- If a lack of data prohibits the reviewers from determining if a standard is being met, a strategy will be developed to acquire the data in a timely manner.

On a continuing basis, the Standards for Healthy Rangelands will direct on-the-ground management on the public lands. They will serve to focus the ongoing development and implementation of activity plans toward the maintenance or the attainment of healthy rangelands.

Quantifiable resource objectives and specific management practices to maintain or achieve the standards will be developed at the local BLM District and Resource Area levels and will consider all reasonable and practical options available to achieve desired results on a watershed or grazing allotment scale. The objectives shall be reflected in site-specific activity or implementation plans as well as in livestock grazing permits/leases for the public lands. These objectives and practices may be developed formally or informally through mechanisms available and suited to local needs (such as Coordinated Resource Management [CRM] efforts).

The development and implementation of standards and guidelines will enable on-the-ground management of the public rangelands to maintain a clear and responsible focus on both the health of the land and its dependent natural and human communities. This development and implementation will ensure that any mechanisms currently being employed or that may be developed in the future will maintain a consistent focus on these essential concerns. This development and implementation will also enable immediate attention to be brought to bear on existing resource concerns.

These standards and guidelines are compatible with BLM's three-tiered land use planning process. The first tier includes the laws, regulations, and policies governing BLM's administration and management of the public lands and their uses. The previously mentioned fundamentals of rangeland health specified in 43 CFR 4180.1, the requirement for BLM to develop these state (or regional) standards and guidelines, and the standards and guidelines themselves, are part of this first tier. Also, part of this first tier are the specific requirements of various federal laws and the objectives of 43 CFR 4100.2 that require BLM to consider the social and economic well-being of the local communities in its management process.

These standards and guidelines will provide for statewide consistency and guidance in the preparation, amendment, and maintenance of BLM land use plans, which represent the second tier of the planning process. The BLM land use plans provide general allocation decisions concerning the kinds of resource

and land uses that can occur on BLM-administered public lands, where they can occur, and the types of conditional requirements under which they can occur. In general, the standards will be the basis for development of planning area-specific management objectives concerning rangeland health and productivity, and the guidelines will direct development of livestock grazing management actions to help accomplish those objectives.

The third tier of the BLM planning process, activity or implementation planning, is directed by the applicable land use plan and, therefore, by the standards and guidelines. The standards and guidelines, as BLM statewide policy, will also directly guide development of the site-specific objectives and the methods and practices used to implement the land use plan decisions. Activity or implementation plans contain objectives which describe the site-specific conditions desired. Grazing permits/leases for the public lands contain terms and conditions which describe specific actions required to attain or maintain the desired conditions. Through monitoring and evaluation, the BLM, grazing permittees, and other interested parties determine if progress is being made to achieve activity plan objectives.

Wyoming rangelands support a variety of uses which are of significant economic importance to the state and its communities. These uses include oil and gas production, mining, recreation and tourism, fishing, hunting, wildlife viewing, and livestock grazing. Rangelands also provide amenities which contribute to the quality of life in Wyoming such as open spaces, solitude, and opportunities for personal renewal. Wyoming's rangelands should be managed with consideration of the state's historical, cultural, and social development and in a manner that contributes to a diverse, balanced, competitive, and resilient economy in order to provide opportunity for economic development. Healthy rangelands can best sustain these uses.

To varying degrees, BLM management of public lands and resources plays a role in the social and economic well-being of Wyoming communities. The National Environmental Policy Act (part of the above-mentioned first planning tier) and various other laws and regulations mandate the BLM to analyze the socioeconomic impacts of actions occurring on public rangelands. These analyses occur during the environmental analysis process of land use planning (second planning tier), where resource allocations are made, and during the environmental analysis process of activity or implementation planning (third planning tier). In many situations, factors that affect the social and economic well-being of local communities extend far beyond the scope of BLM management or individual public land users' responsibilities. In addition, since standards relate primarily to physical and biological features of the landscape, it is very difficult to provide measurable socioeconomic indicators that relate to the health of rangelands. It is important that standards be realistic and within the control of the land manager and users to achieve.

## **STANDARDS FOR HEALTHY PUBLIC RANGELANDS**

### **Standard #1**

**Within the potential of the ecological site (soil type, landform, climate, and geology), soils are stable and allow for water infiltration to provide for optimal plant growth and minimal surface runoff.**

#### **This means that:**

The hydrologic cycle will be supported by providing for water capture, storage, and sustained release. Adequate energy flow and nutrient cycling through the system will be achieved as optimal plant growth occurs. Plant communities are highly varied within Wyoming.



**Indicators may include but are not limited to:**

- Water infiltration rates
- Soil compaction
- Erosion (rills, gullies, pedestals, capping)
- Soil microorganisms
- Vegetative cover (gully bottoms and slopes)
- Bare ground and litter.

The above indicators are applied as appropriate to the potential of the ecological site.

**Standard #2**

**Riparian and wetland vegetation have structural, age, and species diversity characteristic of the stage of channel succession and is resilient and capable of recovering from natural and human disturbance in order to provide forage and cover, capture sediment, dissipate energy, and provide for groundwater recharge.**

**This means that:**

Wyoming has highly varied riparian and wetland systems on public lands. These systems vary from large rivers to small streams and from springs to large wet meadows. These systems are in various stages of natural cycles and may also reflect other disturbance that is either localized or widespread throughout the watershed. Riparian vegetation captures sediments and associated materials, thus enhancing the nutrient cycle by capturing and utilizing nutrients that would otherwise move through a system unused.

**Indicators may include but are not limited to:**

- Erosion and deposition rate
- Channel morphology and floodplain function
- Channel succession and erosion cycle
- Vegetative cover
- Plant composition and diversity (species, age class, structure, successional stages, desired plant community, etc.)
- Bank stability
- Woody debris and instream cover
- Bare ground and litter.

The above indicators are applied as appropriate to the potential of the ecological site.

**Standard #3**

**Upland vegetation on each ecological site consists of plant communities appropriate to the site, which are resilient, diverse, and able to recover from natural and human disturbance.**

**This means that:**

In order to maintain desirable conditions and/or recover from disturbance within acceptable timeframes, plant communities must have the components present to support the nutrient cycle and adequate energy flow. Plants depend on nutrients in the soil and energy derived from sunlight. Nutrients stored in the soil are used over and over by plants, animals, and microorganisms. The amount of nutrients available and the

speed with which they cycle among plants, animals, and the soil are fundamental components of rangeland health. The amount, timing, and distribution of energy captured through photosynthesis are fundamental to the function of rangeland ecosystems.

**Indicators may include, but are not limited to:**

- Vegetative cover
- Plant composition and diversity (species, age class, structure, successional stages, desired plant community, etc.)
- Bare ground and litter
- Erosion (rills, gullies, pedestals, capping)
- Water infiltration rates.

The above indicators are applied as appropriate to the potential of the ecological site.

## **Standard #4**

**Rangelands are capable of sustaining viable populations and a diversity of native plant and animal species appropriate to the habitat. Habitats that support or could support threatened, endangered, species of special concern, or sensitive species will be maintained or enhanced.**

**This means that:**

The management of Wyoming rangelands will achieve or maintain adequate habitat conditions that support diverse plant and animal species. These may include listed threatened or endangered species (U.S. Fish and Wildlife [USFWS]-designated), species of special concern (BLM-designated), and other sensitive species (USFWS-designated), species of special concern (BLM-designated), and other sensitive species (State of Wyoming-designated). The intent of this standard is to allow the listed species to recover and be delisted, and to avoid or prevent additional species becoming listed.

**Indicators may include, but are not limited to:**

- Noxious weeds
- Species diversity
- Age class distribution
- All indicators associated with the upland and riparian standards
- Population trends
- Habitat fragmentation.

The above indicators are applied as appropriate to the potential of the ecological site.

## **Standard #5**

**Water quality meets state standards.**

**This means that:**

The State of Wyoming is authorized to administer the Clean Water Act (CWA). BLM management actions or use authorizations will comply with all federal and state water quality laws, rules and regulations to address water quality issues that originate on public lands. Provisions for the establishment of water quality standards are included in the CWA, as amended, and the Wyoming Environmental

Quality Act, as amended. Regulations are found in Part 40 of the CFR and in *Wyoming's Water Quality Rules and Regulations*. The latter regulations contain Quality Standards for Wyoming Surface Waters.

Natural processes and human actions influence the chemical, physical, and biological characteristics of water. Water quality varies from place to place with the seasons, the climate, and the kind substrate through which water moves. Therefore, the assessment of water quality takes these factors into account.

**Indicators may include but are not limited to:**

- Chemical characteristics (e.g., pH, conductivity, dissolved oxygen)
- Physical characteristics (e.g., sediment, temperature, color)
- Biological characteristics (e.g., macro- and micro-invertebrates, fecal coliform, and plant and animal species).

## **Standard #6**

**Air quality meets Wyoming standards.**

**This means that:**

The State of Wyoming is authorized to administer the Clean Air Act (CAA). BLM management actions or use authorizations will comply with all federal and state air quality laws, rules, regulations, and standards. Provisions for the establishment of air quality standards are included in the CAA, as amended, and the Wyoming Environmental Quality Act, as amended. Regulations are found in Part 40 of the CFR and in Wyoming Air Quality Standards and Regulations.

**Indicators may include but are not limited to:**

- Particulate matter
- Sulfur dioxide
- Photochemical oxidants (ozone)
- Volatile organic compounds (hydrocarbons)
- Nitrogen oxides
- Carbon monoxide
- Odors
- Visibility.

## **BLM WYOMING GUIDELINES FOR LIVESTOCK GRAZING MANAGEMENT**

1. Timing, duration, and levels of authorized grazing will ensure that adequate amounts of vegetative ground cover, including standing plant material and litter, remain after authorized use to support infiltration, maintain soil moisture storage, stabilize soils, allow the release of sufficient water to maintain system function, and to maintain subsurface soil conditions that support permeability rates and other processes appropriate to the site.
2. Grazing management practices will restore, maintain, or improve riparian plant communities. Grazing management strategies consider hydrology, physical attributes, and potential for the watershed and the ecological site. Grazing management should maintain adequate residual plant

cover to provide for plant recovery, residual forage, sediment capture, energy dissipation, and groundwater recharge.

3. Range improvement practices (instream structures, fences, water troughs, etc.) in and adjacent to riparian areas will ensure that stream channel morphology (e.g., gradient, width/depth ratio, channel roughness and sinuosity) and functions appropriate to climate and landform are maintained or enhanced. The development of springs, seeps, or other projects affecting water and associated resources shall be designed to protect the ecological and hydrological functions, wildlife habitat, and significant cultural, historical, and archaeological values associated with the water source. Range improvements will be located away from riparian areas if they conflict with achieving or maintaining riparian function.
4. Grazing practices that consider the biotic communities as more than just a forage base will be designed in order to ensure that the appropriate kinds and amounts of soil organisms, plants, and animals to support the hydrologic cycle, nutrient cycle, and energy flow are maintained or enhanced.
5. Continuous season-long or other grazing management practices that hinder the completion of plants' life-sustaining reproductive and/or nutrient cycling processes will be modified to ensure adequate periods of rest at the appropriate times. The rest periods will provide for seedling establishment or other necessary processes at levels sufficient to move the ecological site condition toward the resource objective and subsequent achievement of the standard.
6. Grazing management practices and range improvements will adequately protect vegetative cover and physical conditions and maintain, restore, or enhance water quality to meet resource objectives. The effects of new range improvements (water developments, fences, etc.) on the health and function of rangelands will be carefully considered prior to their implementation.
7. Grazing management practices will incorporate the kinds and amounts of use that will restore, maintain, or enhance habitats to assist in the recovery of federal threatened and endangered species or the conservation of federally-listed species of concern and other state-designated special status species. Grazing management practices will maintain existing habitat or facilitate vegetation change toward desired habitats. Grazing management will consider threatened and endangered species and their habitats.
8. Grazing management practices and range improvements will be designed to maintain or promote the physical and biological conditions necessary to sustain native animal populations and plant communities. This will involve emphasizing native plant species in the support of ecological function and incorporating the use of non-native species only in those situations in which native plant species are not available in sufficient quantities or are incapable of maintaining or achieving properly functioning conditions and biological health.
9. Grazing management practices on uplands will maintain desired plant communities or facilitate change toward desired plant communities.

## DEFINITIONS

**Activity plans:** Allotment Management Plans (AMP), Habitat Management Plans (HMP), Watershed Management Plans (WMP), Wild Horse Management Plans (WHMP), and other plans developed at the local level to address specific concerns and accomplish specific objectives.

**Coordinated Resource Management (CRM):** A group of people working together to develop common resource goals and resolve natural resource concerns. CRM is a people process that strives for win-win situations through consensus-based decision making.

**Desired plant community:** A plant community which produces the kind, proportion, and amount of vegetation necessary for meeting or exceeding the land use plan/activity plan objectives established for an ecological site(s). The desired plant community must be consistent with the site's capability to produce the desired vegetation through management, land treatment, or a combination of the two.

**Ecological site:** An area of land with specific physical characteristics that differs from other areas both in its ability to produce distinctive kinds and amounts of vegetation and in its response to management.

**Erosion:** (v.) Detachment and movement of soil or rock fragments by water, wind, ice, or gravity. (n.) The land surface worn away by running water, wind, ice, or other geological agents, including such processes as gravitational creep.

**Grazing management practices:** Grazing management practices include such things as grazing systems (rest-rotation, deferred rotation, etc.), timing and duration of grazing, herding, salting, etc. They do not include physical range improvements.

**Guidelines (for grazing management):** Guidelines provide for and guide the development and implementation of reasonable, responsible, and cost-effective management actions at the allotment and watershed level which move rangelands toward statewide standards or maintain existing desirable conditions. Appropriate guidelines will ensure that the resultant management actions reflect the potential for the watershed, consider other uses and natural influences, and balance resource goals with social, cultural/historic, and economic opportunities to sustain viable local communities. Guidelines, and, therefore, the management actions they engender, are based on sound science, past and present management experience, and public input.

**Indicator:** An indicator is a component of a system whose characteristics (e.g., presence, absence, quantity, and distribution) can be measured based on sound scientific principles. An indicator can be measured (monitored and evaluated) at a site- or species-specific level. Measurement of an indicator must be able to show change within timeframes acceptable to management and be capable of showing how the health of the ecosystem is changing in response to specific management actions. Selection of the appropriate indicators to be monitored in a particular allotment is a critical aspect of early communication among the interests involved on the ground. The most useful indicators are those for which change or trend can be easily quantified and for which agreement as to the significance of the indicator is broad based.

**Litter:** The uppermost layer of organic debris on the soil surface, essentially the freshly fallen or slightly decomposed vegetal material.

**Management actions:** Management actions are the specific actions prescribed by the BLM to achieve resource objectives, land use allocations, or other program or multiple use goals. Management actions include both grazing management practices and range improvements.

**Objective:** An objective is a site-specific statement of a desired rangeland condition. It may contain qualitative (subjective) elements, but it must have quantitative (objective) elements so that it can be measured. Objectives frequently speak to change. They may measure the avoidance of

negative changes or the accomplishment of positive changes. They are the focus of monitoring and evaluation activities at the local level. Objectives may measure the products of an area rather than its ability to produce them, but if they do so, it must be kept in mind that the lack of a product may not mean that the standards have not been met. Instead, the lack of a particular product may reflect other factors such as political or social constraints. Objectives often focus on indicators of greatest interest for the area in question.

**Range improvements:** Range improvements include such things as corrals, fences, water developments (reservoirs, spring developments, pipelines, wells, etc.) and land treatments (prescribed fire, herbicide treatments, mechanical treatments, etc.).

**Rangeland:** Land on which the native vegetation (climax or natural potential) is predominantly grasses, grass-like plants, forbs, or shrubs. This includes lands revegetated naturally or artificially when routine management of that vegetation is accomplished mainly through manipulation of grazing. Rangelands include natural grasslands, savannas, shrublands, most deserts, tundra, alpine communities, coastal marshes, and wet meadows.

**Rangeland health:** The degree to which the integrity of the soil and ecological processes of rangeland ecosystems are sustained.

**Riparian:** An area of land directly influenced by permanent water. It has visible vegetation or physical characteristics reflective of permanent water influence. Lakeshores and streambanks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not have vegetation dependent on free water in the soil.

**Standards:** Standards are synonymous with goals and are observed on a landscape scale. Standards apply to rangeland health and not to the important by-products of healthy rangelands. Standards relate to the current capability or realistic potential of a specific site to produce these by-products, not to the presence or absence of the products themselves. It is the sustainability of the processes, or rangeland health, that produces these by-products.

**Terms and conditions:** Terms and conditions are very specific land use requirements that are made a part of the land use authorization in order to assure maintenance or attainment of the standard. Terms and conditions may incorporate or reference the appropriate portions of activity plans (e.g., AMPs). In other words, where an activity plan exists that contains objectives focused on meeting the standards, compliance with the plan may be the only term and condition necessary in that allotment.

**Upland:** Those portions of the landscape which do not receive additional moisture for plant growth from run-off, streamflow, etc. Typically, these are hills, ridgetops, valley slopes, and rolling plains.

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# APPENDIX H—BIOLOGICAL ASSESSMENT

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## H.1 INTRODUCTION

This Biological Assessment (BA) analyzes the potential effects of changes to existing management identified in the selected alternative of the Bureau of Land Management (BLM) Rock Springs Resource Management Plan (RMP) and Environmental Impact Statement (EIS) on threatened or endangered species listed, proposed, or candidate for listing under the federal Endangered Species Act (ESA) or their designated or critical habitat.

In accordance with the ESA and regulatory guidance, we consider:

- Only those organisms that appear on the official species list as seen in Table I-1, and
- Only those species under the regulatory jurisdiction of the U.S. Fish and Wildlife Service (USFWS).

We consider all listed, candidate, and proposed species that may be present in the field office. We will also consider the effects of the proposed plan on the primary constituent elements and/or physical and biological features of designated critical habitat that is likely to be affected by the proposed actions.

This analysis is based on the best scientific and commercial data available at the time this document was written. This includes information such as data collected from BLM databases, vegetation analyses, and direct surveys in the field, the most recent and appropriate scientific research or species information, as well as direct observations by biologists in the field.

This BA analyzes the potential impacts on threatened and endangered plant, fish, and animal species that would result from the implementation of the new Rock Springs RMP. Four potential alternatives are analyzed in the EIS. This BA analyzes the BLM Agency Preferred Alternative.

## H.2 PROJECT HISTORY

The original RMP for this area was the Green River Resources Management Area for what was to become the Rock Springs Field Office. That plan was finalized and signed March of 1996. Because the plan was becoming dated and in need of updating, the Rock Springs Field Office began developing and analyzing a new plan in 2010.

### H.2.1 Purpose and Need

This BA is prepared for the draft EIS that describes the comprehensive analysis of alternatives for the planning and management of lands and resources administered by the BLM in the Rock Spring Field Office area in Wyoming. The public lands and federal mineral estate within the Rock Spring Field Office Resource Management planning area are the subject of the planning effort and this document. This document is a component of the BLM draft RMP/EIS and is prepared in compliance with the National Environmental Policy Act (NEPA) which requires that an environmental impact statement be prepared for any federal actions that may significantly affect the human environment.



Under provisions of the federal Endangered Species Act of 1973, as amended (16 USC Section 1531 et seq.), federal agencies are directed to conserve threatened and endangered species and the habitats in which these species are found. Section 7 (c) of the ESA requires the BLM Rock Spring Field Office to complete a BA to determine the effects of implementing the draft RMP/EIS on listed and proposed species, based on compliance with Section 102 of NEPA. Federal agencies are required to consider, avoid, or prevent adverse impacts to fish and wildlife species. Federal agencies are also required to ensure actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of endangered and threatened species or their critical habitat. The ESA requires action agencies, such as the BLM, to consult or confer with the USFWS when there is discretionary federal involvement or control over the action and to ensure resources are afforded adequate consideration and protection. Formal consultation becomes necessary when the action agency requests consultation after determining the proposed action is likely to adversely affect listed species or critical habitat, or the aforementioned federal agencies do not concur with the action agency's finding (USFWS 1998). In addition, under the 1994 Memorandum of Understanding (MOU) and the 2000 Memorandum of Agreement (MOA) among the BLM, U.S. Forest Service (USFS), USFWS, and National Marine Fisheries Service (NMFS), all four agencies agreed to promote the conservation of candidate and proposed species (Special Status) and streamline the Section 7 consultation and coordination process.

The objective of this programmatic biological assessment is to provide documentation and analysis for the proposed action to meet the federal requirements and agreements set forth among the federal agencies. It addresses federally listed threatened and endangered, candidate, and proposed species and has been prepared under the 1973 ESA Section 7 regulations, in accordance with the 1998 procedures set forth by USFWS and NMFS, and in accordance with the 1994 and 2000 MOU and MOA, respectively. The Rock Spring Field Office, in coordination with the USFWS wildlife biologist, conducted an analysis regarding the effects of the draft RMP/EIS Preferred Alternative on listed species. Site-specific evaluations will be conducted for activities authorized under the RMP and consultation or conference would occur with the USFWS for those activities that may affect threatened, endangered, candidate or proposed species. In addition, BLM would evaluate site-specific activities that may affect BLM Wyoming Sensitive Species (Sensitive Species), in compliance with BLM Manual 6840. This BA will not address Sensitive Species; these are addressed in the draft RMP/EIS.

As part of this biological assessment, BLM requests formal consultation for proposed actions that will lead to water depletion (consumption) in the Platte and/or Colorado River systems. This consultation is required for the four federally listed species of fish in the upper Colorado River system: the endangered Colorado pikeminnow (*Ptychocheilus lucius*), the endangered humpback chub (*Gila cypha*), the endangered bonytail chub (*Gila elegans*), the endangered razorback sucker (*Xyrauchen texanus*) and their designated critical habitat; and six federally listed species in the Platte River system: the endangered whooping crane (*Grus americana*) and its designated critical habitat, endangered interior least tern (*Sterna antillarum*), threatened piping plover (*Charadrius melodus*) and its designated critical habitat, endangered pallid sturgeon (*Scaphirhynchus albus*), and the threatened Western prairie fringed orchid (*Platanthera praeclara*).

This BA considers species present in the action area and addresses those species that may be affected by the BLM's RMP implementation (including actions directly or indirectly causing modifications to the land, water, or air; see 50 CFR 402.02). This primarily includes species present within the Rock Springs planning area. However, the BA includes species outside of the immediate planning area as appropriate. For example,

Sections H.3 and H.4 include species that are not present in the planning area, such as species that use habitats associated with downstream waters directly connected to the planning area. These include species for which management actions undertaken in the planning area could have measurable impacts to critical habitat through water depletions. Consequently, this BA includes initial biological effects determinations for species not present in the RMP planning area (see Table H-1).

The nature and degree of potential effects to species considered in this BA may be influenced by predicted but uncertain future consequences of climate change. In some cases, consequences of future climate change may present new or additional threats to ongoing recovery and management of ESA-listed species. Measurable impacts to ESA-listed species are evaluated using the available information outlined in Appendix T. Where potential impacts of climate change are anticipated, those were specifically considered and discussed within the identified action area. Potential contributions to greenhouse gas emissions resulting from RMP implementation are further addressed in the Draft EIS's Appendix T (Section T.13 – Air Quality: Greenhouse Gases and Climate Change).

## **H.2.2 Analysis Area**

The Rock Springs planning area (Map 1.1) includes approximately 3.5 million acres of BLM administered surface land and 3.6 million acres of BLM-administered mineral estate in portions of Lincoln, Sweetwater, Uinta, Sublette, and Fremont counties in southwestern Wyoming. The Rock Springs Field Office administers a variety of programs including mineral exploration and development, renewable energy, wildlife habitat, outdoor recreation, wild horses, livestock grazing, and historic trails. The planning area includes 13 Wilderness Study Areas (WSA), 10 areas of critical environmental concern (ACEC), five special recreation management areas (SRMA), five wild horse management areas, and a variety of other areas where specific management prescriptions may be developed.

The present list of threatened, endangered, proposed and candidate species and their designated critical habitats was accessed from the USFWS Environmental Conservation Online System website on May 11, 2018.

General management prescriptions for each resource activity are provided in the draft EIS which was sent to the USFWS under a separate cover. Refer to draft RMP/EIS document for specific resource management prescriptions under the Preferred Alternative (Volume 1, Chapter 2).

## **H.2.3 Description of Changes to Existing Management Identified in the Proposed Land Use Plan Revision**

The RMP revision/EIS for the Rock Springs Field Office provides management directions for a variety of programs, including physical resources, mineral resources, fire and fuels, biological resources, heritage and cultural resources, land resources, livestock, recreation, special designations and socioeconomics. The specific management goals, objectives and actions can be found in Chapter 2 of the draft EIS. Table I-1 below lists the USFWS threatened, endangered, or proposed species that are being evaluated for this BA and the initial Biological Determination (NE – No Effect; NLAA – Not Likely to Adversely Affect; LAA – Likely to Adversely Affect; ND – No Determination [candidate species]), by program, as identified in the draft EIS for the RMP revision. The determination in the table indicates that some actions within each program may have an effect; it does not necessarily indicate that the entire program would affect a threatened or endangered species. Please refer to the effects determination for each species in the body of this document for identification of specific sections of the program that would have an effect.

**Table I-1. Initial Biological Determinations**

Program	Species/Critical Habitat								
	Canada Lynx	Grizzly Bear	North American Wolverine	Colorado River Species	Platte River Species	Western Yellow-billed Cuckoo	Monarch Butterfly	Ute ladies'-tresses	Whitebark Pine
Physical Resources	NE	NE	NE	NE	NE	NE	ND	NLAA	NE
Mineral Resources	NE	NE	NE	LAA	LAA	NLAA	ND	NLAA	NE
Fire and Fuels	NLAA	NLAA	NLAA	NE	NE	NE	ND	NLAA	NE
Biological	NE	NE	NE	NE	NE	NLAA	ND	NLAA	NE
Cultural	NE	NE	NE	NE	NE	NE	ND	NLAA	NE
Land	NLAA	NE	NE	NE	NE	NLAA	ND	NLAA	NE
Livestock Grazing	NLAA	NLAA	NLAA	LAA	LAA	NLAA	ND	NLAA	NE
Recreation	NLAA	NE	NE	NE	NE	NLAA	ND	NLAA	NE
Special Designations	NE	NE	NE	NE	NE	NLAA	ND	NLAA	NE
Socioeconomics	NE	NE	NE	NE	NE	NE	ND	NE	NE

### H.3 SPECIES CONSIDERED IN THE ANALYSIS

This BA provides detailed analyses of all federally listed (endangered or threatened) species, proposed species, and designated or proposed critical habitat that may be affected by the actions proposed in the resource management plan revision EIS. Development of this BA was guided by the regulations on Interagency Cooperation (Section 7 of the ESA) in 50 CFR Part 402 and BLM Manual 6840 and additional interagency coordination with the USFWS.

#### H.3.1 Canada Lynx (*Lynx canadensis*)—Threatened

##### Species/Habitat Description

Canada lynx are medium-sized cats with an average adult male weighing ten kilograms (22 lb.) and measuring eighty-five centimeters (33.5 in.) in length, including the tail. Adult females average slightly smaller weighing 8.5 kilograms (19 lb.) and measuring eighty-two centimeters (32 in.) in length, including the tail. Canada lynx are distinguished by long tufts on their ears, as well as large, well-furred paws, and a short, black-tipped tail. During the summer months, their pelage is reddish to gray-brown; whereas in winter, their pelage is more grayish-brown mixed with buff or pale brown with grayish-white or buff-white fur on their torso, legs, and feet (USFWS 2005, USFWS 2012c).

Canada lynx inhabit forests with cold, snowy winters that offer snowshoe hare (*Lepus americanus*) as the primary prey base. In North America, these forests are classified as boreal forests (taiga) consisting mainly of cold tolerant mixed conifers; primarily spruce (*Picea spp.*) and fir (*Abies spp.*) (USFWS 2005). Precipitation is mainly in the form of snow. Snow conditions are an important factor in the location of Canada lynx since they are well adapted to surviving cold winters in deep snow. Canada lynx lives in the boreal forests of North America from Alaska to Newfoundland, descending into the lower 48 states in northern New England (Maine, New Hampshire, New York, and Vermont), the Western Great Lakes region (Michigan, Minnesota, and Wisconsin), the Pacific Northwest (Oregon, Utah, and Washington), and the Rocky Mountains (Colorado, Idaho, Montana, and Wyoming) (McCord and Cardoza 1982). In lower

latitudes, less than 50 degrees north, boreal forests transition to deciduous temperate forest in the Northeast and Great Lakes, and to subalpine forest in the West. Potentially suitable habitat may occur in high elevation spruce-fir habitat throughout Wyoming (USFWS 2005).

## Life History

Canada lynx are solitary carnivores with the ability to change reproductive output in accordance with variable, and sometimes cyclical, food availability. Adult Canada lynx are social only during the breeding season, between February and early April, when they form breeding pairs. They are polygamous and seasonally polyestrous; females cycle continuously until bred during the breeding season. Females typically give birth to one to five kittens (mean = 3.7 kittens) (McCord and Cardoza 1982).

Studies of Canada lynx from Montana and Wyoming show that they have two different types of movement, daily and exploratory. Daily movements, typically within the home range, average two to four kilometers. Exploratory or dispersal movements can range from seven to thirty-nine kilometers and take the animal outside their home range territory (Squires and Laurion 2000). However, fragmentation of habitat in southern regions may lead to increased ranges of movement between suitable foraging and denning sites (Koehler and Britnell 1990). Canada lynx will occasionally abandon established homeranges and become nomadic when prey is extremely scarce (McCord and Cardoza 1982).

Lynx hunt by night for their most common prey, the snowshoe hare, which can make up 70 percent of their diet (Zaveloff 1988). In Canada, Alaska, and Washington snowshoe hares comprised 35-97% of Canada lynx diet (Koehler and Aubry 1994). Secondary prey includes red squirrels (*Tamiasciurus hudsonicus*), ground squirrels (*Urocitellus spp.*), grouse, porcupine (*Erethizon dorsatum*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), deer mice (*Peromyscus spp.*), voles (*Microtus spp.*), shrews (*Sorex spp.*), and even some fish. Deer (*Odocoileus spp.*) and moose (*Alces alces*) occasionally appear in Canada lynx diets, mostly as carrion (Tumilson 1987, Ruediger et al. 2000).

## Status and Distribution

On March 24, 2000 Canada lynx was federally listed as threatened by the USFWS (65 FR 16052) in accordance with provisions of the Endangered Species Act of 1973, as amended.

Canada lynx occupied Wyoming prehistorically (Kurten and Anderson 1980), as well as historically and into the present (Reeve et al. 1986). The best contiguous Canada lynx habitat in Wyoming is in the northwestern and western portion of the state. The remainder is highly fragmented, widely dispersed, and typically isolated by large expanses of arid shrubland (Ehle and Keinath 2002). The distribution of documented Canada lynx specimens and observations in Wyoming indicate that they most consistently occupy the Salt River, Wyoming, Teton, Wind River, Gros Ventre, and Absaroka mountain ranges (Reeve et al. 1986).

Critical habitat for the Canada lynx (50 CFR 17.95(a)) has been designated for portions of Fremont, Lincoln, Park, Sublette, and Teton Counties, including parts of Yellowstone National Park and the Bridger-Teton and Shoshone National Forests. However, none of the critical habitat occurs within the Rock Springs Field Office.

## Threats

Threats to the species include but are not limited to habitat fragmentation, habitat destruction which reduces habitat for potential prey, deforestation, fire, predators, human interactions, vehicle collisions, disease, poaching, and oil and mineral developments (Meaney and Beauvais 2004).

## H.3.2 Grizzly Bear (*Ursus arctos horribilis*)—Threatened

### Species/Habitat Description

Grizzly bear (*Ursus arctos horribilis*) is large, powerful bear with a massive head, small eyes, prominent nose, small rounded ears, and short tail (Pasitschniak-Arts 1993). The species is recognized by its dished facial profile, prominent shoulder hump, and long, slender, slightly re-curved fore claws twice the length of the hind claws (Pasitschniak-Arts 1993, Wilson and Ruff 1999). Dorsal guard hairs of some individuals from western North America are variegated and show a silver tipped or grizzled appearance, hence the name grizzly.

Grizzly bear occupies a variety of habitats throughout their range. They are highly adaptable and are capable of exploiting different landscapes given their lifestyle and intelligence. Grizzly bear habitat in the lower 48 States is characterized by extensive forest cover often interspersed with grasslands and meadows. In Wyoming, these habitats are typically above 1,500 meters (4,920 feet) (Schwartz et al. 2002). Home ranges must include sites suitable for hibernation. Denning sites are most commonly located in the subalpine fir stands on north-facing exposures (Craighead et al. 1995).

### Life History

Except for mating and caring for the young, grizzly bear primarily lead solitary lives, spending most of their time foraging, or looking for food. Mating occurs from June through July. Grizzly bear embryos do not begin to develop until the mother begins her winter hibernation, although mating may have taken place up to six months before. As with other bears, if the mother has not accumulated enough fat to sustain her as well as developing cubs, the embryos typically do not develop. Cubs depend upon their mother's milk for almost a year, stay with their mother for up to three years, and reach breeding maturity at about 4 ½ to 5 ½ years.

Prior to the growing season, grizzly bears congregate on ruminant wintering grounds. As succulent plant species became available, bears concentrate their activity at feeding sites in open areas near cover. After the growing season, bears will move to moist sites where succulent grasses and forbs remain available throughout the season. As valley vegetation declines, bears move to lodgepole pine forests to exploit late season foods such as whitebark pine seeds, berries, mushrooms (*Russula* spp.), and smilacina rhizomes.

Grizzly bear utilize a variety of foods including whitebark pine seeds, army cutworm moths, ants, earthworms, rodents, spawning cutthroat trout (*Oncorhynchus clarki*), ungulates (winter-killed or weakened animals, young in the spring and summer, bull elk weakened by the rut in the fall, and wolf kills), gut piles of hunter-killed elk and moose, fungal sporocarps, horsetails (*Equisetum arvense*), graminoids, forbs, berries, roots (especially roots of the biscuitroot) and anthropogenic foods such as garbage, pet food, and livestock (Kendall 1980, Mace et al. 1997, Mattson 2001, Mattson et al. 1991a, Mattson et al. 1991b, Mattson et al. 2002a, Mattson et al. 2002b, Mattson and Reinhardt 1995, Mattson and Reinhardt 1997, Schwartz et al. 2003). Researchers believe ungulates and whitebark pine seeds appear to be the two most important foods for grizzly bear, followed by army cutworm moths and spawning cutthroat trout (Mattson et al. 1991a, Mattson et al. 1991b, Mattson et al. 1992). On average, ungulate meat comprises nearly half of the annual energy intake for adult females and more than half for adult males (Reinhardt et al. 2001).

Intensive feeding occurs in autumn prior to denning. The most frequently used denning habitat is located in subalpine fir forest (Craighead et al. 1995). Mean den emergence among males was the fourth week in March and ranged from the first week in February to the fourth week in May.

### Status and Distribution

The grizzly bear was listed as threatened in the lower 48 States under the Endangered Species Act by the U.S. Fish and Wildlife Service in 1975 (Fed. Reg. 40:145, 31734-31736).

Historically, the range of the grizzly in North America extended south from Alaska to northern Mexico and east from the Pacific coast to the Canadian Prairies and U.S. Great Plains west of the Mississippi River (Hall and Kelson 1959, Schwartz et al. 2003). They also occurred throughout most of Wyoming (Long 1965). Currently, five populations remain below the Canadian border. The population in Wyoming is located in the northwestern portion of the state (Servheen 1999). In Wyoming and elsewhere the grizzly bear has expanded its range in the past two decades and has reoccupied historic habitats. Current range expansion of the grizzly bear population is particularly evident in the southern portion of the ecosystem in Wyoming (Schwartz et al. 2002).

## Threats

The primary reasons for the decline of grizzly bear in North America are excessive human-caused mortality and habitat loss (Schwartz et al. 2003). Displacement of grizzly bears from quality habitats, resulting from roads and other man-made structures (such as fences and buildings) may prevent dispersal, force bears to use poorer quality sites, increase intraspecific competition by further forcing more bears into limited remote habitat, and may cause social disruption in areas away from developments and roads (Kasworm and Manley 1989, McLellen 1989). These disturbances may result in displacement and/or disruption of normal behavior patterns such as copulation, movement, denning, foraging, physiological arousal without overt behavioral response, and even direct loss of habitat via avoidance.

Environmental events, such as drought and climate change may also pose significant threats to long-term persistence of small, isolated populations and are therefore real threats to persistence of the grizzly bear population in Wyoming. Researchers are particularly concerned about impacts of future climate warming on two very important foods, seeds of whitebark pine and aggregated army cutworm moths. These two species occur at high elevations and are particularly susceptible to climate warming.

### H.3.3 North American Wolverine (*Gulo gulo luscus*)—Proposed Threatened

#### Species/Habitat Description

The North American wolverine is the largest land-living species in the weasel family, or mustelids. The wolverine usually weighs between 17 and 40 pounds, stands up to 1.5 feet tall, and is generally 33 to 44 inches long (including tail). The male is larger than females.

Wolverine populations are currently known in the North Cascades Range in Washington; the Northern Rockies of Montana, Idaho, Wyoming; and a small portion of Oregon (Wallowa Range). The wolverine also resides in Alaska, Canada, and Russia. The wolverine ranges widely, up to 15 miles a day, and needs lots of habitat. Home ranges can vary from 100 to 600 square miles. In the lower 48, they live primarily at high altitudes with alpine vegetation, but can venture to lower elevations. It is estimated that 25 to 300 live in the lower 48 states.

#### Life History

The North American wolverine is the largest land-living species in the weasel family, or mustelids. The wolverine usually weighs between 17 and 40 pounds, stands up to 1.5 feet tall, and is generally 33 to 44 inches long (including tail). The male is larger than females.

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## Threats

Wolverines in the lower 48 states are under consideration for protection under the Endangered Species Act. Although the wolverine has very specific habitat needs, was never a common species, and was widely persecuted, the primary reason now for a threatened listing is climate change. Wolverines need deep snow to birth and rear their young.

### H.3.4 Piping Plover (*Charadrius melodus*)—Threatened

#### Species/Habitat Description

The piping plover (*Charadrius melodus*) is a sandy-gray, robin-sized shorebird with one dark breast band (Wilcox 1959, Haig 1992). It has a dark stripe across the crown during the breeding season. Other characteristics include a white wing stripe and a white rump that is visible in flight.

Piping plover nest on sandbars and sand and gravel beaches with short, sparse vegetation along inland lakes, on natural and dredge islands in rivers, in gravel pits along rivers and on salt-encrusted bare areas of sand, gravel, or pebbly mud on interior alkali ponds and lakes.

#### Life History

Piping plover feed along the water's edge on small insects, worms, terrestrial insects, crustaceans and mollusks (Haig 1992). Piping plover are present on breeding grounds from late March through August. Nests are shallow, scraped depressions occasionally lined with small pebbles, shells, or other material. A clutch of four eggs is usually laid in late May or early June with hatching in 27 to 31 days. Piping plover are considered monogamous, but because nests are often destroyed at the beginning of the breeding season, new mates are known to have been chosen. One brood per year is characteristic of the piping plover, however, females are capable of laying several clutches if a nest is destroyed (Haig 1992). Eggs and young are tended by both parents.

#### Status and Distribution

On December 11, 1985, the piping plover was listed as endangered in the Great Lakes watershed of both the United States and Canada, and as threatened in the remainder of its range in the U.S. (Northern Great Plains, Atlantic and Gulf Coasts, Puerto Rico, Virgin Islands), Canada, Mexico, Bahamas, and the West Indies (USFWS 1985, COSEWIC 2001).

The species has not been known to occur in Wyoming. However, the species is included in the document because management actions in Wyoming may affect critical habitat for the species by extension through water depletions.

## Threats

Because the species does not occur in the state of Wyoming, threats to the species within the state would only occur from water depletions. Since 1978, the USFWS has consistently found through formal Section 7 consultations with federal agencies that actions resulting in depletions to flows in the Platte River system

are likely to jeopardize the continued existence of one or more federally-listed threatened or endangered species and adversely modify critical habitat (Instruction Memorandum No. WY-2007-039).

### **H.3.5 Whooping Crane (*Grus americana*) – Endangered**

#### **Species/Habitat Description**

Whooping crane (*Grus americana*) adults are snow white, except for black primary feathers on the wings, and a bare, red face and crown. The bill is a dark olive-gray which will turn lighter during the breeding season. The whooping crane's eyes are yellow, and the long, thin legs and feet are gray-black. There is a patch of reddish-black bristly feathers on the top and back of the head, atop a long neck. Black feathers on the side of the head below the yellow eye look like a long, dark moustache. The whooping crane is the only large white bird with black wingtips that flies with its neck straight out in front and the legs trailing far behind. It also is the only one that walks or stands on long, thin legs and does not swim.

Immature cranes are a reddish-cinnamon color that results in a mottled appearance as the white feather bases extend. The juvenile plumage is gradually replaced through the winter months and becomes predominantly white by the following spring as the dark red crown and face appear. Yearlings achieve the typical adult appearance late in their second summer or fall.

The whooping crane continue to use ancestral breeding areas, migration routes and wintering grounds. Over the last fifty years, there has been little natural dispersal of the species. Low population numbers likely have contributed to this lack of dispersal into new habitats and territories.

Breeding habitat for whooping crane is typically poorly drained wetlands within the headwaters of the Nyarling, Sass, Klewi, and Little Buffalo rivers. The area is interspersed with multiple shallow-water wetlands of various sizes, shapes and depths. The wetlands are separated by narrow ridges that are vegetated with white spruce (*Picea glauca*), black spruce (*P. mariana*), tamarack (*Larix laricina*), willows (*Salix spp.*) and an understory of dwarf birch (*Betula glandulosa*), Labrador tea (*Ledum groenlandicum*), and bear berry (*Arctostaphylos uvalursi*). Bulrush (*Scirpus validus*) is the dominant plantin the potholes used for nesting; although cattail (*Typha spp.*), sedge (*Carex aquatilis*), musk-grass(*Chara spp.*), and other aquatic plants are common (Lewis 1995).

#### **Life History**

Whooping crane are omnivorous, obtaining foods from soil, water, and vegetation. They feed primarily on mollusks, crustaceans, aquatic insects, minnows, frogs, and snakes (Allen 1956, Novakowski 1966). During migration, frogs, fish, plant tubers, crayfish, insects, and waste grains in harvested fields comprise the whooping crane's diet. In winter, whooping crane feed primarily on crabs and clams. They will wander into upland areas following flooding by rain to feed on acorns, snails, mice, voles, crayfish, grasshoppers, and snakes (Bishop and Blankenship 1982, Hunt 1987).

Whooping crane are monogamous and form life-long pair bonds but will re-mate following the death of a mate. Typically, they construct nests of bulrush and lay one to three eggs in late April and early May. The incubation period is about 29 to 31 days. Whooping crane will re-nest if the first clutch is lost or destroyed before mid-incubation. Both sexes share incubation and brood-rearing obligations. Even though most pairs lay two eggs, seldom does more than one chick reach fledging.

#### **Status and Distribution**

On March 11, 1967, whooping crane were listed as an endangered species under the Endangered Species Preservation Act of 1966 (80 Stat. 926; 16 USC 668aa(c)). On January 4, 1974 (39 FR 1171) the species



was “grandfathered” into the Endangered Species Act of 1973, as amended.

Whooping crane occur exclusively in North America and were likely never very common in historic times. The principal historic breeding range stretched across central North America from central Alberta through southern Saskatchewan and Manitoba, northeastern North Dakota, western Minnesota, southern Wisconsin, northern Iowa, and northern Illinois (Allen 1952). In 1975 the USFWS and Canadian Wildlife Service tried to establish an experimental whooping crane population within the Rocky Mountains. Whooping crane eggs were placed in the nests of sandhill cranes. The experiment did not work because the whooping cranes thought they were sandhill cranes and they didn't breed or establish a new population. No whooping cranes are known to occur in Wyoming at this time. The species is included in the document because management actions in Wyoming may affect critical habitat for the species by extension through water depletions.

## Threats

Because the species does not occur in the state of Wyoming, threats to the species within the state would only occur from water depletions. Since 1978, the USFWS has consistently found through formal Section 7 consultations with federal agencies that actions resulting in depletions to flows in the Platte River system are likely to jeopardize the continued existence of one or more federally-listed threatened or endangered species and adversely modify critical habitat (Instruction Memorandum No. WY-2007-039).

### **H.3.6 Western Yellow-billed Cuckoo (*Coccyzus americanus*)— Threatened**

#### **Species/Habitat Description**

The western yellow-billed cuckoo (*Coccyzus americanus*), is a medium-sized bird of about 30 centimeters (12 in.) in length and weighing about 60 grams (2 ounces). The species has a slender, long-tailed profile with a fairly stout and slightly down-curved bill which is blue-black with yellow on the basal half of the lower mandible. The feathers are grayish-brown above and white below with rufous primary flight feathers. The tail feathers are boldly patterned with black and white below. The legs are short and bluish- gray, and adults have a narrow, yellow eye ring. Juveniles resemble adults; however, the tail patterning is less distinct, and the lower bill may have little or no yellow. Males and females differ slightly; males tend to have a slightly larger bill, and the white in the tail tends to form oval spots, whereas in females, the white spots tend to be connected and less distinct (Hughes 1999).

The western yellow-billed cuckoo is one of two subspecies of the yellow-billed cuckoo (UDWR 2003). The western subspecies is found intermittently throughout the western United States in dense riparian vegetation, including cottonwood and willow stands, tamarisk thickets, Russian olive, and orchards.

Two hectares (approximately 5 acres) of dense riparian vegetation is considered the absolute minimum size for cuckoo occupancy, as no cuckoos have been detected successfully nesting in patches smaller than two hectares (Corman and Magill 2000, Halterman et al 2001).

#### **Life History**

Western yellow-billed cuckoo's breeding season is in late spring. Nests are generally built from 4 to 10 feet off the ground in riparian vegetation. Both the male and the female incubate the three to four eggs for nine to eleven days. Both parents feed the young which fledge in approximately three weeks (Kaufmann 1996).

Western yellow-billed cuckoos primarily consume insects such as caterpillars, cicadas, beetles, grasshoppers, and katydids, as well as lizards, frogs, eggs of other birds, berries, and small fruits. Population density appears to rise and fall in relation to insect outbreaks (Kaufmann 1996).

## Status and Distribution

In 2012, the western subspecies of the yellow-billed cuckoo was proposed as threatened under the ESA (78 Federal Register 61621-61666). The USFWS has found that the species population status warrants listing.

In Wyoming, the Wyoming Natural Diversity Database, WYNDD, ranks the state abundance of yellow-billed cuckoos as 'Very Rare' - fewer than 1,000 resident individuals (Keinath and Beauvais 2002). Others consider it an uncommon summer resident (WGFD 1997, Dorn and Dorn 1999). The accuracy of these designations is still unclear given the lack of survey data. There have been very few observations reported in Wyoming and fewer still that have documented breeding. Breeding was documented within the city limits of Sheridan in 1980 (Downing 1990). Within the last twenty-five years, breeding was suspected along East Wolf Creek and Big Goose Creek near Sheridan, along the North Platte River in Rawhide Wildlife Habitat Management Area (WHMA), near Springer WHMA in Goshen County and along the South Fork Miller Creek north of Sundance.

## Threats

Threats the western yellow-billed cuckoo face are related to habitat destruction and degradation, livestock use of riparian areas, water withdrawals, and human development. Hughes (1999) also summarized effects of heavy pesticide use during the last fifty years has likely contributed to population declines by removing and/or poisoning prey. The pesticide use may have also resulted in directly poisoning birds and causing egg shell thinning.

## H.3.7 Bonytail Chub (*Gila elegans*) – Endangered

### Species Description/Habitat

Bonytail chub (*Gila elegans*), are medium-sized (less than 600 mm or 23.62 in.) fish in the minnow family. Adult bonytail are gray or olive colored on the back with silvery sides and a white belly. Adult bonytail have an elongated body with a long, thin caudal peduncle. The head is small and compressed compared to the rest of the body. The mouth is slightly overhung by the snout and there is a smooth low hump behind the head that is not as pronounced as the hump on a humpback chub.

Vanicek (1967) reported that bonytail were generally found in pools and eddies in the absence of, although occasionally adjacent to, strong current and at varying depths generally over silt and silt-boulder substrates. Adult bonytail are sympatric with humpback chub in shoreline eddies among emergent boulders and cobble, and adjacent to swift current (Valdez 1990). The diets of bonytail are presumed similar to that of the humpback chub (USFWS 2002).

### Life History

Bonytail are considered a species that is adapted to main stem rivers because it has been observed in pools and eddies (Vanicek 1967, Minckley 1973). Spawning of bonytail has never been observed in a river, but ripe fish were collected in Dinosaur National Monument in Utah during late June and early July suggesting that spawning occurred at water temperatures of about 18 degrees Celsius (°C) (64.4 degrees Fahrenheit [°F]) (Vanicek and Kramer 1969). Similar to other closely related *Gila* species, bonytail probably spawn in rivers in spring over rocky substrates. Spawning has been observed in reservoirs over rocky shoals and shorelines. It has been recently hypothesized that flooded bottomlands may provide important bonytail nursery habitat.

## Status and Distribution

Bonytail chub were first listed as endangered on April 23, 1980 (45 FR 27710). It is currently designated as endangered throughout its entire range. Currently, no documented self-sustaining populations exist in the wild. Formerly reported as widespread and abundant in main stem rivers, its populations have been greatly reduced (Jordan and Evermann 1896). Remnant populations presently occur in the wild in low numbers (USFWS 2002). The species is not known to occur in Wyoming. However, the species is included in the document because management actions in Wyoming may affect critical habitat for the species by extension through water depletions.

## Threats

The primary threats to bonytail are stream flow regulation and habitat modification, competition with and predation by nonnative fishes, hybridization with other native *Gila* species, poor land-use practices, degraded water quality, pesticides, and pollutants (USFWS 2002). The existing habitat, altered by these threats, has been modified to the extent that it impairs essential behavior patterns, such as breeding, feeding, and sheltering. Threats to bonytail in relation to hybridization are essentially the same threats identified for humpback chub. Bonytail were extirpated in some areas primarily because of rotenone poisoning and cold-water releases from dams (USFWS 2002).

## H.3.8 Colorado Pikeminnow (*Ptychocheilus lucius*)—Endangered

### Species/Habitat Description

The Colorado pikeminnow (*Ptychocheilus lucius*), are the largest cyprinid fish (minnow family) native to North America. It is an elongated pike-like fish that during pre-development times may have grown as large as 6 feet in length and weighed nearly 100 pounds (Behnke and Benson 1983). Today, Colorado pikeminnow rarely exceed 3 feet in length or weigh more than 18 pounds; such fish are estimated to be 45 to 55 years old (Osmundson et al. 1997). The mouth of this species is large and nearly horizontal with long slender pharyngeal teeth (located in the throat), adapted for grasping and holding prey. Adults are strongly counter shaded with a dark, olive back, and a white belly. Young Colorado pikeminnow are silvery and usually have a dark, wedge-shaped spot at the base of the caudal fin.

Colorado pikeminnow live in warm-water reaches of river main stems and larger tributaries and require uninterrupted stream passage for spawning migrations and dispersal of young. The species is adapted to a hydrologic cycle characterized by large spring peaks of snowmelt runoff and low, relatively stable base flows (Junk et al. 1989; Johnson et al. 1995). Colorado pikeminnow use relatively deep, low-velocity eddies, pools, and runs that occur in near-shore areas of main river channels (Tyus and McAda 1984, Valdez and Masslich 1989, Tyus 1990, 1991, Osmundson et al. 1995). In spring, Colorado pikeminnow use floodplain habitats, flooded tributary mouths, flooded side canyons, and eddies that are available only during high flows (Tyus 1990, 1991, Osmundson et al. 1995). Gravel and cobble deposits are usually found in the habitat to be used for spawning.

### Life History

The diet of Colorado pikeminnow longer than 7.6 to 10.2 cm (3 to 4 in.) consists almost entirely of other fish (Vanicek and Kramer 1969). Males become sexually mature earlier and at a smaller size than do females, though all are mature by about age seven and 500 mm (20 in.) in length (Vanicek and Kramer 1969, Seethaler 1978, Hamman 1981).

Colorado pikeminnow are long-distance migrators; adults move hundreds of miles to and from spawning areas and require long sections of river with unimpeded passage. Adults require pools, deep runs, and eddy habitats maintained by high spring flows. High spring flows provide an important cue to prepare adults for migration (Harvey et al. 1993). These high spring flows maintain channel and habitat diversity, flush sediments from spawning areas, rejuvenate food production, form gravel and cobble deposits used for

spawning, and rejuvenate backwater nursery habitats.

Spawning occurs after spring runoff at water temperatures typically between 18 and 23°C (64.4°F and 73.4°F). It has occurred as early as June 15<sup>th</sup> in some years and as late as August 15<sup>th</sup>. Although direct observation of Colorado pikeminnow spawning is not possible, in one study, radio telemetry indicated spawning may occur over cobble-bottomed riffles (Tyus 1990).

Known spawning sites are also in canyon-bound reaches (McAda 2000). Because of their mobility and environmental tolerances, adult Colorado pikeminnow are more widely distributed than other life stages. Distribution patterns of adults are stable during most of the year, but distribution of adults change in late spring and early summer due to migration to spawning (Tyus and McAda 1984, Tyus 1985, 1990, 1991, Irving and Modde 2000).

After hatching and emerging from the spawning substrate, Colorado pikeminnow larvae drift downstream to backwaters in sandy, alluvial regions, where they remain through most of their first year of life (Holden 1977; Tyus and Haines 1991; Muth and Snyder 1995). Backwaters and the physical factors that create them are vital to successful recruitment of early life stages of the Colorado pikeminnow. It is important to note that these backwaters are formed after cessation of spring runoff within the active channel and are not floodplain features. Colorado pikeminnow larvae occupy these in-channel backwaters soon after hatching. They tend to occur in backwaters that are large, warm, deep (average, about 0.3 m. or 1 foot in the Green River), and turbid (Tyus and Haines 1991). Recent research has confirmed these preferences and suggested that a particular type of backwater is preferred by Colorado pikeminnow larvae and juveniles (Day *et al.* 1999a, 1999b, Trammell and Chart 1999).

## Status and Distribution

The Colorado pikeminnow was first listed on March 11, 1967 (32 FR 4001). Full protection under the ESA occurred on January 4, 1974. It is currently designated as endangered throughout its range, except in the Salt and Verde River drainages in Arizona. Based on early fish collection records, archaeological finds, and other observations, the Colorado pikeminnow was once found throughout warm water reaches of the entire Colorado River Basin down to the Gulf of California, including reaches of the upper Colorado River and its major tributaries, the Green River and its major tributaries, and the Gila River system in Arizona (Seethaler 1978). Colorado pikeminnow have never been found in colder, headwater areas.

Major declines in Colorado pikeminnow populations occurred during the dam-building era of the 1930s through the 1960s. Behnke and Benson (1983) summarized the decline of the natural ecosystem, pointing out that dam, impoundments, and water use practices drastically modified the river's natural hydrology and channel characteristics throughout the Colorado River Basin. Dams on the main stem broke the natural continuum of the river ecosystem into a series of disjunct segments, blocking native fish migrations, reducing temperatures downstream of dams, creating lacustrine habitat, and providing conditions that allowed competitive and predatory nonnative fishes to thrive both within the impounded reservoirs and in the modified river segments that connect them. This has reduced the ideal habitat of the species. The highly modified flow regime in the lower basin coupled with the introduction of nonnative fishes decimated populations of native fish.

No self-sustaining populations of this species are currently known to exist in Wyoming and no recent sightings have been reported in Wyoming. However, in 1988, an individual was captured from the Little Snake River in Wyoming, which is a tributary to the Yampa River in Colorado where populations are known to exist. Management actions that involve water depletions in Wyoming may affect critical habitat for the species in states located downstream.

## Threats

The primary threats to Colorado pikeminnow are stream flow regulation and habitat modification, competition with and predation by nonnative fishes, and pesticides and pollutants (USFWS 2002). The existing habitat, altered by these threats, has been modified to the extent that it impairs essential behavior patterns, such as breeding, feeding, and sheltering. These impairments are described in further detail below. Data collected by Osmundson and Kaeding (1991) indicated that during low water years, nonnative minnows capable of preying on or competing with larval endangered fishes greatly increased in numbers.

Threats from pesticides and pollutants include accidental spills of petroleum products and hazardous materials, discharge of pollutants from uranium mill tailings, and high selenium concentration in the water and food chain (USFWS 2002). Accidental spills of hazardous material into critical habitat can cause immediate mortality when lethal toxicity levels are exceeded. Pollutants from uranium mill tailings cause high levels of ammonia that exceed water quality standards. High selenium levels may adversely affect reproduction and recruitment (Hamilton and Wiedmeyer 1990, Stephens et al. 1992, Hamilton and Waddell 1994, Hamilton *et al.* 1996, Stephens and Waddell 1998).

### **H.3.9 Humpback Chub (*Gila cypha*)—Threatened**

#### **Species/Habitat Description**

The humpback chub (*Gila cypha*) is a medium-sized freshwater fish (less than 500 mm or 19.7 in.) of the minnow family. The adults have a pronounced dorsal hump, a narrow, flattened head, a fleshy snout with an inferior-subterminal mouth, and small eyes. It has silvery sides with a brown or olive colored back.

Backwaters, eddies, and runs have been reported as common capture locations for young-of-year humpback chub (Valdez and Clemmer 1982). Data indicates that young utilize shallow areas. Habitat suitability index curves developed by Valdez *et al.* (1990) indicate young-of-year prefer average depths of 0.64 m. (2.1 ft.) with a maximum of 1.55 m. (5.1 ft.). Average velocities were reported at 0.06 meters per second (0.2 feet per second). Valdez et al. (1982), Wick et al. (1979), and Wick et al. (1981) found adult humpback chub in water averaging 50 feet in depth with a maximum depth of 92 feet. In these localities, humpback chub were associated with large boulders and steep cliffs. Gorman and Stone (1999) reported that ripe male humpback chub aggregated in areas of complex habitat structure (i.e., matrix of large boulders and travertine masses combined with chutes, runs, eddies, 0.5–2.0 m. deep) and were associated with deposits of clean gravel.

Generally, humpback chub show fidelity for canyon reaches and move very little (Miller et al. 1982, Archer et al. 1985, Burdick and Kaeding 1985, Kaeding et al. 1990). Tyus and Karp (1989) reported that humpback chub occupy shoreline eddy habitats. They also reported that spring peak flows were important for reproductive success because availability of these habitats is greatest during spring runoff.

#### **Life History**

Tyus and Karp (1991) found that humpback chub spawn during spring and early summer following peak flows at water temperatures of about 20°C (68°F). They estimated that the spawning period for humpback chub ranges from May into July, with spawning occurring earlier in low-flow years and later in high-flow years; spawning was thought to occur only during a four to five-week period (Karp and Tyus 1990). Peak hatch of humpback chub larvae occurs on the descending limb of the hydrograph following spring runoff at maximum daily water temperatures of approximately 20 to 21°C (68 to 69.8°F) (Chart and Lentsch 1999). Although humpback chub are believed to broadcast eggs over mid-channel cobble and gravel bars, spawning in the wild has not been observed for this species.

Humpback chub do not make extensive migrations (Karp and Tyus 1990). In some areas the humpback

chub were essentially restricted to a 1.6 km (1 mile) reach. These results were based on the recapture of Carlin-tagged fish and radio telemetry studies conducted from 1979 to 1981 (Valdez et al. 1982) and 1983 to 1985 (Archer et al. 1985, USFWS 1986, Kaeding et al. 1990).

Chart and Lentsch (1999) estimated hatching dates for young *Gila* between 1992 and 1995. They determined that hatching occurred on the descending limb of the hydrograph as early as June 9, 1992 at a flow of 139 cubic meters per second ( $m^3/s$ ) (4,908.7 cubic feet per second [ $ft^3/s$ ]) and as late as July 1, 1995 at a flow of 731  $m^3/s$  (25,815  $ft^3/s$ ). Instantaneous daily river temperatures on hatching dates overall years ranged from 20 to 22°C (68 to 71.6°F). Newly hatched larvae average 6.3–7.5 mm (0.25–0.3 in.) total length and one-month-old fish are approximately 20 mm (0.79 in.) long (Holden 1973, Suttikus and Clemmer 1977, Minckley 1973, Snyder 1981, Hamman 1982, Behnke and Benson 1983, Muth 1990). No evidence exists of long-distance larval drift (Miller and Hubert 1990, Robinson *et al.* 1998). Upon emergence from spawning gravels, humpback chub larvae remain in the vicinity of bottom surfaces near spawning areas (Marsh 1985, Chart and Lentsch 1999).

High spring flows that simulate the magnitude and timing of the natural hydrograph provide a number of benefits to humpback chub. Bank-full and over-bank flows provide allochthonous energy input to the system in the form of terrestrial organic matter and insects that are utilized as food. High spring flows clean spawning substrates of fine sediments and provides physical cues for spawning. High flows also form large re-circulating eddies used by adult fish (Chart and Lentsch 1999). High spring flows (50% exceedance or greater) have been correlated with increased recruitment of humpback chub (Chart and Lentsch 1999).

## Status and Distribution

Humpback chub was listed as endangered on March 11, 1967. The USFWS designated critical habitat for the humpback chub on March 21, 1994 (59 FR 13374). Historic abundance of the humpback chub is unknown and historic distribution is surmised from various reports and collections that indicate the species presently occupies about 68% of its historic habitat (Tyus 1998).

There are no known occurrences of humpback chub in Wyoming (USFWS 2002). However, the species is included in the document because management actions in Wyoming may affect critical habitat for the species by extension through water depletions.

## Threats

The primary threats to humpback chub are stream flow regulation and habitat modification, competition with and predation by nonnative fishes, parasitism (Asian tapeworm), hybridization with other native *Gila* species, and pesticides and pollutants (USFWS 2002). The existing habitat, altered by these threats, has been modified to the extent that it impairs essential behavior patterns, such as breeding, feeding, and sheltering. Although historic data are limited, the apparent range-wide decline in humpback chub is likely due to a combination of factors including alteration of river habitats by reservoir inundation, changes in stream discharge and temperature, competition with and predation by introduced fish species, and other factors such as changes in food resources resulting from stream alterations (USFWS 1990). Also, extensive human alterations throughout the basin prior to faunal surveys may have depleted or eliminated the species from some river reaches before its occurrence was documented.

## H.3.10 Pallid Sturgeon (*Scaphirhynchus albus*)—Endangered

### Species/Habitat Description

The pallid sturgeon (*Scaphirhynchus albus*), is an ancient species that existed during the dinosaur era. Pallid sturgeon are considered to be one of the most poorly known and infrequently seen freshwater fishes in North America. Pallid sturgeon are one of the largest (76 to 172 cm, 30 to 60 in.) fishes found in the Missouri-

Mississippi River drainage and weigh up to 39 kilograms (85 pounds). They are typically light brown on the dorsal surface and white underneath. The fish has a flattened, shovel-shaped snout and fleshy chin barbels are located about one third the distance between the mouth and snout. They also have inner barbels which are located about one half the length of the outer barbels. Pallid sturgeon have a long, slender, flattened and armored region from the dorsal fin to the tail fin (caudal peduncle), which has along upper lobe.

The pallid sturgeon is a bottom dweller, found in areas of strong current and firm sand bottom in the main channel of large, turbid rivers. Little is known about pallid sturgeon life requirements; however, we do know that they prefer large, turbid, free-flowing riverine habitats with rocky substrates. Pallid sturgeons are well adapted to life on the river bottom and inhabit areas of swifter water.

### Life History

Pallid sturgeon grow very slowly and mature late. Spawning occurs from June through August. The barbels, used to sense the river bottom and identify prey, allow the fishes mouth to quickly capture it. Prey consists of aquatic insects and small, bottom dwelling fish. Pallid sturgeon have been known to live beyond 60 years and do not reach sexual maturity until about age 20.

Pallid sturgeon are known to hybridize in nature with closely related sturgeon, and it is thought that loss of habitat and reproductive cues (water level raises) are the likely causes. Since their former unique spawning habitats have been altered or lost largely due to damming, altered hydrology, and channelization, both species are forced to spawn at the few remaining acceptable locations. Fertilization occurs externally, and hybridization occurs when eggs and sperm of the two species are mixed in the riverwater as it flows over the gravelly spawning beds.

### Status and Distribution

The pallid sturgeon was listed by the USFWS as endangered on September 6, 1990, in accordance with provisions of the ESA.

The range of pallid sturgeon includes the headwaters of the Missouri River (Fort Benton-Great Falls, Montana) through the Mississippi River to New Orleans, Louisiana. Pallid sturgeon have not been documented in Wyoming. The species is included in this document because management actions in Wyoming may affect critical habitat for the species by extension through water depletions within the Platt River drainage basin.

### Threats

Because the species does not occur in the state of Wyoming, threats to the species within the state would only occur from water depletions. Since 1978, the USFWS has consistently found through formal Section 7 consultations with federal agencies that actions resulting in depletions to flows in the Platte River system are likely to jeopardize the continued existence of one or more federally-listed threatened or endangered species and adversely modify critical habitat (Instruction Memorandum No. WY-2007-039).

## H.3.11 Razorback Sucker (*Xyrauchen texanus*)—Endangered Razorback Sucker (*Xyrauchen texanus*) – Endangered

### Species/Habitat Description

The razorback sucker (*Xyrauchen texanus*) is a fish belonging to the family *Catostomidae* (meaning “down mouth”). Razorback sucker have ventral mouths with thick lips covered with papillae and no scales on its head. Suckers are bottom browsers, sucking up or scraping off small invertebrates, algae, and organic matter

with their fleshy, protrusible lips (Moyle 1976). Razorback sucker are the only sucker with an abrupt sharp-edged dorsal keel behind its head, which becomes larger with age. The head and keel are dark, the back is olive-colored, the sides are brownish or reddish, and the abdomen is yellowish white (Sublette et al. 1990). Adults often exceed 3 kg (6 lbs.) in weight and 600 mm (2 feet) in length. Razorback sucker are long-lived; an adult sucker can live 44 to 50 years. Razorback suckers reach maturity between two and seven years of age (Minckley 1983). They can produce viable gametes even when quite old. Survival adaptations include the ability to spawn in a variety of habitats and flow regimes, and over a long season.

Outside of the spawning season, adult razorback sucker occupy a variety of shoreline and main channel habitats including slow runs, shallow to deep pools, backwaters, eddies, and other relatively slow velocity areas associated with sand substrates (Tyus 1987, Tyus and Karp 1989, Osmundson and Kaeding 1989, Valdez and Masslich 1989, Osmundson and Kaeding 1991, Tyus and Karp 1990). Razorback sucker are also known to be in off-channel habitats, flooded side canyons, washes, side channels and tributaries (Muth et al. 1998). Habitat requirements of young and juvenile razorback sucker in the wild are not yet well known, particularly in native riverine environments.

### **Life History**

Razorback sucker can spawn as early as age three or four, when they are 35.6 cm (14.4 in.) or more in length. Depending on water temperature, spawning can take place as early as November or as late as June. In the upper Colorado River basin, razorbacks typically spawn between mid-April and mid-June. These fish reportedly migrate long distances to spawn, congregating in large numbers in spawning areas. Sexually mature razorback sucker are generally collected on the ascending limb of the hydrograph from mid-April through June (depending on the specific location). Tyus and Karp (1990) and Osmundson and Kaeding (1991) reported off-channel habitats to be much warmer than the main stem river. Razorback sucker presumably moved to these areas for feeding, resting, sexual maturation, spawning, and other activities associated with their reproductive cycle.

### **Status and Distribution**

The razorback sucker was first listed on October 23, 1991 (56 FR 54957). It is currently designated as endangered throughout the entire range of the species. On March 14, 1989, the USFWS was petitioned to conduct a status review of the razorback sucker (56 FR 54957). The final rule stated, "Little evidence of natural recruitment has been found in the past 30 years, and numbers of adult fish captured in the last 10 years demonstrate a downward trend relative to historic abundance."

Critical habitat was designated for razorback sucker on March 21, 1994 (59 FR 13374).

Historically, razorback sucker were found in the main stem Colorado River and major tributaries in Arizona, California, Colorado, Nevada, New Mexico, Utah, and in Mexico (Ellis 1914, Minckley 1983). Between 1992 and 1995 larval razorback sucker were collected in the middle and lower Green River and within the Colorado River inflow to Lake Powell (Muth 1995). Average fecundity recorded in studies ranged from 100,800 to 46,740 eggs per female (Bestgen 1990).

Although the species has not been found in Wyoming, there is potential for the species to travel up the Little Snake River, which flows into Colorado from Wyoming and ends up in the Yampa River (USFWS 2002). The main reason this species is included in the document is because management actions in Wyoming may affect critical habitat for the species by extension through water depletions.

### **Threats**

The primary threats to razorback sucker are stream flow regulation and habitat modification, competition with and predation by nonnative fishes, and pesticides and pollutants (USFWS 2002). The existing



habitat, altered by these threats, has been modified to the extent that it impairs essential behavior patterns, such as breeding, feeding, and sheltering. Significant changes have occurred in razorback sucker habitat through diversion and depletion of water, introduction of nonnative fishes, and construction and operation of dams (56 FR 54957) and reservoirs. Dams on the main stem of the river and its major tributaries have segmented the river system, blocked migration routes, and changed much of the river habitat into lake habitat. Dams have also drastically altered flows, temperatures, and channel geomorphology. Wydoski and Wick (1998) identified starvation of larval razorback sucker due to low zooplankton densities in the main channel and loss of seasonal floodplain habitats which provide adequate zooplankton densities for larval food as one of the most important factors limiting recruitment. Lower regulated river discharges, channelization, and levee construction has restricted access to those floodplain habitats. Reduction in spring peak flows may hinder the ability of razorback sucker to form spawning aggregations because spawning cues are reduced (Modde and Irving 1998).

### **H.3.12 Monarch Butterfly (*Danaus plexippus*) —Candidate**

#### **Species/Habitat Description**

The **monarch butterfly** or simply **monarch** (*Danaus plexippus*) is a milkweed butterfly. is amongst the most familiar of North American butterflies and an iconic pollinator, although it is not an especially effective pollinator of milkweeds. Its wings feature an easily recognizable black, orange, and white pattern, with a wingspan of 8.9–10.2 cm (3.5–4.0 in) stripe across each hindwing. Monarch butterflies live mainly in prairies, meadows, grasslands and along roadsides, across most of North America. The adult butterfly drinks nectar from a variety of flowers, uncoiling and extending its long proboscis to sip food. When not in use, this flexible “tongue” coils back into a spiral.

#### **Life History**

Most monarchs will live only a few weeks, but the generation that emerges in late summer and early fall is different. These butterflies are born to travel and may live for eight or nine months to accomplish their lengthy migration. Scientists think the monarchs use the position of the sun and the changing weather to know when it’s time for their long journey.

#### **Status and Distribution**

Monarch butterflies are found across North America wherever suitable feeding, breeding, and overwintering habitat exists. They are broken into two populations separated by the Rocky Mountains, called the eastern and the western populations.

#### **Threats**

Monarch butterflies are threatened by pesticides, which are killing the milkweed plants they need to survive. Urban development and climate change are also threats.

### **H.3.13 Ute Ladies’ -tresses (*Spiranthes diluvialis*)—Threatened**

#### **Species/Habitat Description**

Ute ladies’-tresses (*Spiranthes diluvialis*) is a perennial orchid (family Orchidaceae). The orchid first appears above ground as a rosette of thickened grass-like leaves that is very difficult to distinguish from other vegetation. The species’ leaves are up to 1.5 cm (0.6 in.) wide and 28 cm (11 in.) long; the longest leaves are near the base. The usually solitary flowering stem is 20 to 50 cm (8 to 20 in.) tall, terminating in a spike of three to 15 white or ivory flowers.

Ute ladies'-tresses occur in soils moist at the surface throughout the growing season. Soils are generally silty-loam often underlain with cobble and gravel. The habitat settings are early to mid-successional riparian habitats (i.e. well established soils and vegetation) along perennial streams and rivers such as moist stream edges, high flow channels, old oxbows, vegetated point bars, and other fluvial features with appropriate hydrology, and areas supported by groundwater and sometimes supplemented by irrigation water, such as wet meadows and springs (Fertig et al. 1994, USFWS 1995, Fertig 2000, 57 FR 2048). Uteladies'-tresses appears to be well adapted to disturbance caused by water movement through flood plains as well.

Besides hydrology, common habitat features include dominance by perennial graminoids and forbs and low vegetative cover. Where colonies occur in more wooded areas, plants are usually found on the edges of small openings and along trails (Ward and Naumann 1998). Ute ladies'-tresses is intolerant of crowding and competition. The orchid may persist for some time in the grassy understory of these woody riparian shrublands, but do not appear to thrive under these conditions (Ward and Naumann 1998).

### Life History

Flowering of Ute ladies'-tresses occurs from mid-July through August. However, in some locations it may bloom in early July or may still be in flower as late as early October. Some individuals remain under ground or do not flower each year (Arft 1993).

Because of the unique anatomy of orchid flowers, only certain insects can accomplish pollination. Reproduction of the Ute ladies'-tresses orchid is strictly sexual, with bumblebees (*Bombus spp.*) and anthophorans (*Anthophora spp.*) as the primary pollinators (Sipes and Tepedino 1995). These insects visit the orchids for the nectar and pollination is accomplished incidentally.

### Status and Distribution

The Ute ladies'-tresses was federally listed as threatened on January 17, 1992 (57 FR 2048) in its entire range. No critical habitat has been designated for the species. To date, no recovery plan has been approved for this species; however, a draft recovery plan has been written (USFWS 1995).

### Threats

Factors that could affect Ute ladies'-tresses include natural or human-directed disturbances, such as the modification of the hydrology, increased recreation use, introduction or proliferation of invasive species, improper herbicide use, reduction or loss of pollinators, and improper season and stocking rate of livestock grazing (USFWS 1995). Also, hay mowing or fire may hinder maintaining habitat in suitable condition for the orchid by reducing cover, litter, and weeds, especially when these occur during the flowering period (Arft 1995; Moseley 1998).

Many Ute ladies'-tresses locations are in more mountainous or rural locations and are not as susceptible to the direct effects of urban development; however, some scattered locations are subject to rural development such as gravel pit excavations, irrigation diversions, and construction of irrigation canals, roads, and bridges. Channelization of waterways and construction of levees that isolate a stream from its floodplain prevent formation and maintenance of suitable habitat (USFWS 2003). It also eliminates periodic disturbances that remove competitive shrub stands which also re-saturates and rejuvenates old and new habitats (Moseley 1998, Fertig 2000; USFWS 2003).

Recreational development may cause either direct (placing trails or campgrounds in occupied or suitable habitat) or indirect (changes in hydrology or spread of invasive species) impacts to Ute ladies'-tresses (USFWS 2003). Campground facilities, road and parking lot construction and improvements, trails, and fisheries improvements result in increased access to and use of riparian and wetland areas that support Ute

ladies'-tresses. Water-related activities are a common concern for continued viability of Ute ladies'-tresses throughout Wyoming (USFWS 2003).

A newly emerging and potentially serious threat to the orchid range wide is the proliferation of invasive native and non-native plant species. Ute ladies'-tresses is susceptible to below-ground competition, such as from strongly rhizomatous species, or above-ground competition that reduces light such as taller trees and shrubs. Tamarisk (*Tamarisk spp.*) is of particular concern as it readily invades newly formed habitat before Ute ladies'-tresses can become established, is extremely competitive, and may change soil surface chemistry through deposition of salty leaf litter. Management of invasive species, while a high priority for many agencies and those in the public, requires a high and continuous investment in labor and other resources in order to achieve success. This effort is often difficult to sustain over time.

### **H.3.14 Western prairie fringed orchid (*Platanthera praeclara*)— Endangered**

#### **Species/Habitat Description**

The western prairie fringed orchid (*Platanthera praeclara*) is distinguished by its large flowers (up to 1½ inches in length), large angular column, and broadly triangular petals. The lateral lobes of the lip on the western species are often, but not always, narrower than those on the eastern species. The western prairie fringed orchid is a stout, erect, long-lived perennial with a showy open raceme (spike) of up to two dozen white to creamy white flowers often an inch or more in size, each with a long nectar spur. The sepals of the orchid are tinged with pale green. The lip, or lower petal of each flower is deeply three-lobed and fringed. The single smooth stem can grow from 2 ½ to 4-feet tall. There are two to five simple, elongate leaves which are thick and hairless.

The western prairie fringed orchid occurs most often in remnant native prairies and meadows. It has also been observed at disturbed sites such as oil fields and roadside ditches. In the southern part of its range it is more likely to be found in mesic upland prairies and in the north in wet prairies and sedge meadows. It is also known from prairies and swales in sand dune complexes that are fed by shallow underground water.

#### **Life History**

The western prairie fringed orchid is a long-lived perennial. It emerges in May and blooms in June through July in the northern parts of its range. The orchid is a plant of the tall grass prairie and requires direct sunlight for growth. The flowers are fragrant at night and are pollinated by large sphinx moths, which is required for seed set. Any threat to these insects, such as the use of insecticides, is a threat to the western prairie fringed orchid.

#### **Status and Distribution**

On September 28, 1989, the western prairie fringed orchid was classified as endangered under the ESA. The western prairie fringed orchid is known to occur in seven U.S. states and one Canadian province. It was first documented by the Lewis and Clark expedition. The species' historic range extends from the Red River valley of Manitoba, Minnesota, and North Dakota, spreading southeastward to Iowa and Missouri and westward to northeastern Oklahoma, eastern Kansas, central Nebraska and eastern South Dakota. (Sather 1991).

The western prairie fringed orchid is not known to occur in Wyoming. As the species requires the maintenance of functional and dynamic tallgrass prairie, it is unlikely that the species will ever be found to occur within the state. The potential for effects is limited to depletion issues surrounding the Platte River drainage basin, although no critical habitat is designated for this species.

## Threats

Because the species does not occur in the state of Wyoming, threats to the species within the state would only occur from water depletions. Since 1978, the USFWS has consistently found through formal Section 7 consultations with federal agencies that actions resulting in depletions to flows in the Platte River system are likely to jeopardize the continued existence of one or more federally-listed threatened or endangered species and adversely modify critical habitat (Instruction Memorandum No. WY-2007-039).

### H.3.15 Whitebark Pine (*Pinus albicaulis*) – Threatened

#### Species/Habitat Description

Whitebark pine can grow to 12–18 m tall (40–60 ft) and, rarely, up to 1.5 m (5 ft) in diameter. They are shorter, or even shrub-like, in Krummholz form, at higher, windier elevations. The bark is thin, scaly, and grayish. Their needles are 4–10 cm long (1.5–3 in), in clumps of 5 at the ends of upswept branches. Being monoecious, both smaller male pollen cones (typically scarlet in full bloom) and larger female seed-bearing cones grow on the same tree. The purple to dark brown female cones grow 5–8 cm long (2–3 in) on the branch tips of the upper tree. Unlike other pines, the scales don't open at maturity to release their seeds.

Whitebark pine commonly grow on ridges and just below tree line between 4300–12,100 ft, at higher elevations than most other pines. Their fast growing, deep roots and stout stems buffer them from strong and desiccating mountain winds. They range from southwest Canada south to the Sierra Nevada in California and east to northern Nevada and Wyoming.

#### Life History

Whitebark pine rely heavily on the Clark's nutcracker (*Nucifraga columbiana*) for reproduction. The nutcracker's stout, straight beak can dig through the unopened scales of a mature pine cone for its seeds. The pea-sized seeds are roundish, wingless, and larger than other conifer seeds. Carrying the seeds in a pouch under its tongue, the bird buries them in shallow soil caches, sometimes up to 10 km away. Nutcrackers are known to cache up to 90,000+ seeds in a good seed crop year! The lucky seeds that escape the nutcracker's sharp spatial memory for finding them again often sprout. Slow-growing, the whitebark pine takes 25 to 30 years to begin producing cones. The cones take 2 years to mature. Peak cone production begins at 60 to 80 years and continues for several hundred more.

#### Status and Distribution

Whitebark pine has the largest distribution of any five-needle white pine in North America, but whitebark pine health is deteriorating rapidly across its range, particularly in the Rocky Mountains, Pacific Northwest, and northern Sierra Nevada.

#### Threats

Whitebark pine was listed as Threatened under the Endangered Species Act in December of 2020. Whitebark pine are in steep decline throughout their range from a combination of factors. Warmer temperature trends have triggered epidemic outbreaks of the mountain pine beetle (*Dendroctonus ponderosae*) and lowered the trees' resistance to white pine blister rust, caused by a nonnative fungus (*Cronartium ribicola*), both of which have killed millions of trees. Historical fire suppression allowed the march of more shade-tolerant competitors into whitebark pine habitat, replacing this species through succession.

## H.4 Description and EFFECTS OF SELECTED ALTERNATIVE

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## Description of Selected Alternative Actions

### Physical Resources

The physical resources program includes management actions for air quality, soil, geologic, water, and lands with wilderness characteristics.

Management actions in the RMP revision/EIS Preferred Alternative for air quality include those related to monitoring and analyses, as well as dust abatement (Actions 1000-1017)..

Management actions in the RMP revision/EIS Preferred Alternative for soil and geologic resources include maintain or improve soil health (Action 1100), apply guidelines and appropriate measures to all management actions for soil health, erosion and sedimentation, stability, support the hydrologic cycle, minimize or control elevated concentration of salts and sediment loading from federal lands to the Colorado River system, , manage soil resources using BMPs, and coordinate with NRCS prior to approval of surface disturbance. (Actions 1101-1106), avoidance and mitigation of surface disturbing activities in areas of low reclamation potential (Actions 1107 and 1108), monitoring of channel crossings (Action 1109), Inventory, evaluate, maintain, or improve existing landscape-level or site-specific watershed improvement projects where necessary (Action 1110), protect soils in partnership with private, local, state, tribal, and federal programs. (Action 1111), reduction of erosion and sediment yield (Action 1112), and protection and reclamation (Actions 1113- 1116).

Management actions in the RMP/EIS Preferred Alternative for water resources include assessment, maintenance, rehabilitation, and reclamation of water control structures (Action 1300), acquisition of watershed resources (Action 1301), erosion control, reduction of sediment, phosphate and salinity (Actions 1302-1310), Manage wetlands and floodplains in accordance applicable laws and policy. Require projects to improve the ecological integrity of the dunal ponds in any associated activity planning. (Actions 1311), protection of wetlands, riparian areas, and perennial streams (Actions 1313-1316), management and protection of aquifer recharge areas (Actions 1317-1320), cooperate with State of Wyoming 208 Water Quality Plan (Action 1321), acquisition of water rights (Action 1322), hydrologic investigations (Action 1323), and avoidance of herbicides and pesticides (Action 1324). Prohibit surface occupancy and surface disturbance in areas of shallow unconfined aquifers (Action 1325).

Management actions in the RMP/EIS Preferred Alternative for lands with wilderness characteristics deal with acquisition and/or general management of the identified areas (Actions 1500-1517).

### Mineral Resources

The mineral resources program includes management actions for locatable minerals, leasable minerals, and salable minerals.

Management actions in the RMP/EIS Preferred Alternative for locatable minerals identify open areas, and areas that withdrawal from locatable minerals will be pursued (Actions 2000-2001).

Management actions in the RMP/EIS Preferred Alternative for leasable minerals include actions specific to geothermal, oil and gas, geophysical exploration, and solid leasable minerals. The solid leasable minerals portion includes coal, sodium/trona and oil shale. Management for geothermal includes identification of open areas and community use (Action 2100-2102). Management described in the oil and gas actions include downhole spacing and conditions of approval (COA) (Actions 2200-), identification of suspensions, open areas, and closures (Actions 2202-2210 and 2212-2219), buyouts or exchanges of existing leases (Action 2220) and form a working group to evaluate monitoring data and determine recommendations for

changes in management (Action 2221). Management described in the geophysical exploration actions includes description of the assessment and approval of geophysical activities (Action 2300). Management described in the coal section of the solid leasable minerals program includes identification of open and closed areas (Actions 2400-2403, and 2407), and evaluations of development potential (Actions 2404-2406). Management described in the trona/sodium portion of the solid leasable minerals program includes identification of open and closed areas, as was areas available for leasing (Actions 2408-2411). Management described in the oil shale portion of the solid leasable minerals program includes identification of open and closed areas, and how leasing would occur (Actions 2412-2419).

Management actions in the RMP/EIS Preferred Alternative for salable minerals include identification of land open and closed to salable minerals (Actions 2500-2502), establish no new community pits and localized common use areas (Action 2503), establishment of no new mineral material sites (Action 2504), prohibition and closure of topsoil areas (Action 2505), restore saleable mineral pits no longer in use (Action 2506), and restrictions on collection of petrified wood (Action 2507).

### **Fire and Fuels Management**

Management actions in the fire and fuels program include managing fire and fuels consistent with local plans and in coordination with landowners, affected partners and local governments (Actions 3000, 3001 and 3003), emergency stabilization and rehabilitation (Action 3002), management of wildland urban interface (WUI) areas (Action 3004), prioritizing suppression actions (Actions 3005-3006, 3010, and 3012), use of heavy equipment (Action 3007), use of aerial suppression agents (Action 3008), and areas where prescribed fire is allowed and prohibited (Actions 3011 and 3013).

### **Biological Resources**

The biological resources program includes management actions for forest and woodlands, vegetation, riparian and wetland, fish and wildlife, and wild horses.

Management actions in the RMP/EIS Preferred Alternative for forest and woodlands include conducting vegetation management and timber sale activities in accordance with best management practices (BMP), and in cooperation with private, state and federal managers (Actions 4000-4001), managing forest and woodland health for vegetation health and providing products to the public (Actions 4002-4009), permitting the collection/harvest of other forest products (Action 4010), identification of appropriate cutting methods and times (Actions 4011-4014), slash disposal (Action 4015) leaving harvested areas to revegetate naturally (Action 4016), and stand management (Actions 4017-4024).

Management actions in the RMP/EIS Preferred Alternative for the grassland and shrubland communities' portion of the vegetation program includes using the best available science in coordination with other local and state expertise (Action 4100), desired plant community objectives (Actions 4102-4103), use of fire and other treatments (Actions 4103-4110), resting from livestock grazing (Action 4111), and vegetation treatment design (Action 4112).

Management actions in the RMP/EIS Preferred Alternative for invasive species and pest management include cooperation and collaboration with local efforts to control invasive plants or noxious weeds (Actions 4200-4201, 4206, 4208 and 4211), utilizing the integrated pest management approach, public education and BMPs to manage noxious weeds and invasive plant species, and limit control to mechanical and biological methods (Actions 4202, 4207), maintaining adequate baseline and ensuring efficient monitoring methods (Actions 4203-4204), appropriate application of pesticide or herbicide (Actions 4205, 4212 and 4213), and inspection and cleaning or decontamination of fire suppression equipment (Action 4210).

Management actions in the Riparian and Wetland Resources section include: achieve PFC and/ maintained

standards, address negative trends, manage for late successional stage, maintain, improve or restore habitats, pursue additional acreage (Actions 4300-4303).

Changes to the fish and wildlife resources in this RMP revision/EIS are broken down into general wildlife, big game, raptors, special status plants, and special status wildlife.

Management actions in the general wildlife portion of the fish and wildlife resources section of the RMP revision/EIS include coordination and cooperation with the state wildlife agency (Action 4400), maintain, restore and/or enhance fish and wildlife habitat (Action 4401), prevent or reduce habitat loss (Action 4404) guidance for land exchanges and acquisitions (Action 4406), general management guidance for migratory birds (Action 4407) guidance for water developments, and exclosures (Actions 4408-4411), guidance for coordination with wildlife services (Action 4412), development of habitat management plans (Action 4413), apply restrictions to protect important habitats (Action 4417), and prohibit renewable energy projects in important wildlife habitats (Action 4418)

Management actions in the big game portion of the fish and wildlife section of the RMP revision/EIS include management of wildlife habitat to provide forage to support Wyoming Game and Fish Departments Strategic Habitat Plan (Action 4419) prohibit livestock grazing seasonally during big game birthing (Action 4420), and management of surface disturbing activities in crucial winter and parturition ranges (Actions 4421-4427).

Management actions in the raptor portion of the fish and wildlife section of the RMP revision/EIS include: identification of raptor nest sites and management of surface occupancy, surface disturbance and disruptive activities near occupied and historic raptor nests (Actions 4428-4434).

Management actions in the fish portion of the fish and wildlife section of the RMP revision/EIS include: guidance for management and restriction of surface disturbing and construction activities, linear crossings, and exception requests for timing restrictions (Actions 4435-4436).

The special status species section of the biological resources program includes plants, wildlife, and fisheries.

Management actions in the special status plant species portion of the RMP revision/EIS include guidance on when to require special status plant species surveys (Action 4600), management of surface disturbing activities, including when to prohibit or restrict activities (Actions 4602-4605, 4608, 4610, 4613, and 4614), guidance on when to pursue acquisition (Action 4607), guidance on determining if they meet criteria for ACEC designation (Action 4609), and guidance on when vegetation treatments and range improvements are appropriate or should be prohibited (Actions 4611-4612).

Management actions in the special status species, wildlife and fisheries portion of the biological resources program include management to protect and improve habitats, and managing habitat for ecological benefits (Action 4616 - 4617), consult or conference with USFWS in accordance with policy and law (4618), management of infrastructure and disruptive activities within habitats to protect the species and their habitats (Actions 4619-4620), management specific to protection of special status amphibian and reptiles (Actions 4622), and management of surface disturbing and disruptive activities within mountain plover habitat (Action 4623). Apply restrictions to fish bearing streams (Action 4624)

Management actions in the wild horse section of biological resources include management of the Little Colorado Herd Management Area (HMA identify appropriate management level for number of horses in the HMA, and guidance for the preparation of gather plans (Actions 4900-4917).

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## Heritage and Visual Resources

The heritage and visual resources program include management for cultural, paleontological, and visual resources.

Management actions in the cultural section of the heritage and visual resources program include identification and management of cultural resources in coordination with state and federal regulations (Actions 5000-5007 and 5108-5118), management of prehistoric steatite quarries (Action 5008), guidance for pursuing land exchanges (Action 5009), management of other cultural resources and sites (Actions 5010-5013 and 5100-5106), guidance on the tri-territory site, including closures and exclusions (Action 5107), guidance on management of the West Sand Dunes Archeological District, including designating it as part of the Steamboat Mountain ACEC and requiring heritage resource inventories (Actions 5122 – 5127), and guidance on consultation with Tribal leaders, SHPO and proponents (Action 5200 - 5201).

Management actions in the paleontological section of the heritage and visual resource program include requiring that potential fossil yield classification (PFYC) be a standard part of review for surface disturbing activities (Action 5300) and guidance on management of paleontological resources (Actions 5301-5309).

Management actions in the visual section of the heritage and visual resource program include designating VRM Classes (Actions 5400-5406) and management and restrictions of surface disturbing activities to meet the VRM requirements (Actions 5407-5413).

## Land Resources

The land resources program includes management for lands and realty, renewable resources, right-of-way (ROW) corridors, livestock grazing, recreation, and off-highway vehicles (OHV).

Management actions in the lands and realty section of the land resources program include restrictions for public health and safety and protection of significant resource values (Action 6000), management guidance for geologic carbon sequestration exploration and site characterization (Action 6001), identification of open areas for realty actions (Actions 6002-6003), stipulations and restrictions for pipeline trenches and abandoned pipelines (Action 6004), guidance for land withdrawals (Actions 6006- 6011), and management guidance for land tenure adjustments (Actions 6012-6015).

Management actions in the renewable energy section of the land resources program include management guidance for cooperation and coordination with other government agencies (Actions 6100-6101), management guidance for policies and BMPs (Actions 6102-6103, 6107,6108), and identification of areas open to renewable energy development and areas closed to renewable energy development (Actions 6104-6106).

Management actions in the ROW corridors section of the land resources program include coordination with other agencies (Action 6200), management guidance on open areas and avoidance areas (Actions 6201-6202, and 6205), management of the Aspen Mountain Communication Site, as well as other sites (Actions 6203-6204), management guidance on designation or closure of corridors (Actions 6206- 6208,6210), and management guidance for locating pipelines, power lines, and other utilities (Action 6209).

The management actions in the Backcountry Byways section of the RMP revision include retaining the Wild Horse Scenic Loop Byway, the Tri- Territory Loop, the Lander Road, Red Desert, Fort LaCledde Loop, and the Little Mountain Loop Byways (Actions 6303-6304), consider additional travel routes that meet the criteria, designate the Cherokee Trail and Tri- Territory short loop and consider for mountain bike use (Actions 6306).

Management actions in the livestock grazing management section of the land resources program include



management guidance for providing opportunities for grazing while meeting or making progress towards Wyoming Standards for Healthy Rangelands (Action 6400), management guidance for providing forage for livestock, wild horses, wildlife, while meeting other multiple use objectives (Actions 6401-6403,6405,6406,6410 and 6417), management guidance for authorizing livestock grazing at current active use animal unit month (AUM) levels, and adjusting the AUMs when monitoring or other analysis demonstrates the need (Action 6404), management guidance for closing exclosures and recreation areas to livestock grazing to protect other resource values (Actions 6407-6409), management guidance for the placement of salt and mineral supplements (Action 6411), , incorporation of adaptive management and collaboration with interested parties to examine effects of intense industrial operations on access to the forage base, and applying reasonable and prudent mitigation (Action 6413), prohibit grazing in riparian areas not meeting PFC (Action 6414), and management guidance authorizing livestock conversions and range improvements (Actions 6416).

Management actions in the recreation section of the land resources program include management guidance for allowing commercial and organized events, special recreation permits and other recreation authorizations (Actions 6500, 6503), management of SRMAs, and other identified areas for recreation opportunities (Actions 6501, 6507 and 6510), requirements for the health and safety of visitors (Action 6502), management guidance of undeveloped recreation sites, providing consideration for recreation use and other resource values and uses (Action 6504), management guidance for overnight camping, including prohibiting camping within 50 feet of riparian or surface water, and closing areas if resource damage occurs (Actions 6505-6506), management guidance for development, on a case-by-case basis, of recreation and interpretation project plans for locations in the planning area (Action 6508), Manage Green, Sweetwater, Big Sandy and Little Sandy rivers with priorities given to other resource values (6510), limiting of firewood cutting to downed, dead trees in designated areas within developed recreation sites, and within areas outside of developed recreation sites (Actions 6511- 6512), limiting recreation site development projects and access routes along streams and reservoirs (Action 6513), consider development of permanent recreation site and facilities in undeveloped areas (Actions 6514-6515), management guidance for allowing surface disturbing activities within 3 miles of developed recreation sites (Action 6516), restriction of geophysical activities within developed and semi- developed recreation sites (Action 6518), management guidance for development, on a case-by-case basis, of wild horse viewing areas (Action 6519), management guidance for allowing gold panning or causal use related to prospecting (Action 6520), management guidance for the Continental Divide Snowmobile Trail SRMA, for over-the-snow vehicle, hiking, equestrian and mountain bike uses, and designating the area as VRM Class II (Actions 6522-6528), management guidance for the Green River SRMA would include, not retaining the SRMA designation, and designating the area as VRM Class I-IV (Actions 6529-6531), management guidance for the Killpecker Sand Dunes SRMA would include not retaining it as a SRMA (Actions 6532), management guidance for the Oregon and Mormon Pioneer National Historic Trails would include not retaining the SRMA designation (Actions 6537), , management guidance for the Wind River Front SRMA would include not retaining the SRMA designation (Action 6543)

Management actions in the OHV section of the land resources program include coordination and collaboration with other agencies, governments, communities, and landowners (Actions 6600, 6605), engineering and locating roads and trails to accommodate OHV activities while minimizing impacts and providing management guidance for use (Actions 6601-6604), management guidance for closing areas where use has caused adverse effects (Action 6606), identification of open and closed areas (Action 6607), management guidance for permitting, on a case-by-case basis, organized OHV events (Action 6608).

### **Special Designations**

The special designations program for the RMP revision/EIS include management for congressionally designated trails, wilderness study areas, wild and scenic rivers, management areas, and ACECs.

Management actions in the congressionally designated trails section of the special designations program include management guidance for designation of National Historic Trails (Action 7002), management guidance for the designated trail corridors, including allowing mineral leasing and mineral materials with CSU restrictions making the area a ROW avoidance area, allowing mineral material disposals on a case-by-case basis, designating the areas as VRM Class II, except utility crossings, which would be managed as Class III (Actions 7003-7005), management guidance for highly visible projects that are outside the corridor (Action 7006), allowing major utility systems only within identified utility corridors (Action 7007), prohibiting large, heavy vehicles on contributing segments (Action 7008), prohibiting geophysical exploration and blading (Actions 7009- 7010), management guidance prohibiting segments of the trails from use as industrial access roads (Actions 7011-7012), prohibiting surface disturbing activities in the Parting-of-the-Ways historical site and retaining the existing mineral withdrawal (Actions 7012-7013), management guidance for new audible and atmospheric affects along NHT corridors (7014), management for the Dry Sandy Swales segment(7015,7016), management guidance for trails that are eligible but not designated, including management of actions within 1/2 mile of a contributing segment being an NSO for fluid minerals, closed to mineral materials sales, and designated as a ROW exclusion area (Actions 7017-7019), management guidance for allowing geophysical activities (Action 7020)

The management actions in the wilderness study area section of this RMP revision/EIS provide for future designations of these areas if they are not designated as wilderness, as well as designation of their current VRM Class (Actions 7100-7103).

Management actions in the wild and scenic rivers section of the special designations program include identification of areas that meet the suitability factors for designation, and which areas would be designated as wild or scenic (Actions 7200-7202), management guidance for the areas designated as wild, including making them ROW exclusion areas, prohibiting surface disturbing activities other than those that maintain or enhance the river, closing those areas to mineral leasing and related exploration, closing the areas to mineral materials sales, prohibiting land disposal actions, designating the areas as VRM Class II, limiting geophysical exploration, prohibiting use of motorized and non-motorized vehicles for geophysical exploration, limiting other motorized and non-motorized vehicle use to designated roads, and prohibiting commercial timber sales and harvesting (Actions 7203-7226). Management guidance for rivers with the scenic classification would include maintaining or enhancing the outstandingly remarkable historic, scenic, and recreational values, and the relatively unmodified character of the area, limiting geophysical exploration to foot access and prohibiting motorized and non-motorized vehicles, limiting other motorized and non-motorized vehicle use to designated roads, prohibiting use of mountain bikes on trails, and prohibiting commercial timber sales and harvesting (Actions 7227-7230). Management actions for the recreational classification include focusing interim management of parcels potentially meeting the recreation classification on maintaining or enhancing historic, scenic and recreational values, limiting geophysical exploration to foot access, and limiting other motorized and non-motorized access to designated roads, prohibiting the use of mountain bikes on trails, and prohibiting commercial timber sales and harvesting (Actions 7231-7234).

Management actions in the Management Areas section of the Special Designations program include maintaining or enhancing resource values for areas designated as special management areas, ensuring concepts of open space are maintained, analyze and prioritize increases in vegetation production, restrict travel off of designated roads (Actions 7300 – 7304). Other actions include management guidance for the Red Desert Watershed area which would reduce the size of the area, designate it as VRM Class II, allow surface disturbing activities subject to mitigation, manage important wildlife habitats for no-net-loss, eliminate right-of-way windows and prohibit overhead powerlines (Actions 7305-7311). The Pine

Mountain Management Area would expand to include the Salt Wells Area and be renamed as the Salt Wells area. The new Salt Wells area would be designated as the Salt Wells portion of the Greater Red Creek ACEC. Actions in this area would include, designating the area as a ROW exclusion area, closing the area for mineral leasing and geophysical activities, prohibiting activities that preclude the achievement Land Health Standards reserving any increase in vegetative production for watershed stabilization and improvement of wildlife forage, development of an HMP focused on mule deer, pronghorn and elk crucial winter range, as well as elk parturition habitat, and raptor concentration areas. Management would also include management of sensitive wildlife habitat, limiting travel to designated roads, designation of VRM Class II for the area, allowing for minimum development of recreation facilities, and protecting or improving wildlife habitats by preventing or reducing habitat loss or alteration and managing sensitive wildlife habitats for no-net-loss of habitat (Actions 7312-7324). Management guidance for the Four J Basin portion of the Pine Mountain Management area would include petitioning to segregate and pursue withdrawal from mineral location, closing the area to mineral material sales designating as a ROW exclusion area, ensuring that prescriptions to maintain important values would address mineral exploration and development under pertinent laws and policies, and developing and implementing a habitat management plan focused on crucial wildlife habitats (Actions 7325-7328). Management guidance for the Sugarloaf Basin Management Area will include designating it as a portion of the Greater Red Creek ACEC, designating as a ROW exclusion area, prohibit surface disturbing activities, closing the area to mineral leasing and geophysical activities, reserving any increase in vegetation production for watershed stabilization and improvement purposes and wildlife forage, managing habitats for no-net-loss of habitats by applying surface use restrictions, designating the area as VRM Class II, and providing onsite controls and facilities for recreation development (Actions 7329-7335). The Pinnacles Geologic Area will be designated as an ACEC and will have the following management: prohibit surface disturbance, petition to segregate and pursue withdrawal from mineral location, close to mineral materials sales and solid mineral leasing, designate as a ROW exclusion area, manage the Pinnacles Geologic Feature as a portion of the ACEC (Action 7336- 7339). The Monument Valley Management Area will be designated as the Monument Valley ACEC and will have the following management: close the federal sections to mineral leasing, exploration and development, close to mineral material sales, manage surface disturbing activities, including rights-of-way, to avoid slopes greater than 20% and other highly erosive areas, manage sensitive wildlife habitats for no-net-loss of habitat, retain the oil shale withdrawal, limit vehicle use to designated roads and trails, designate as VRM Class II, do not develop recreation sites in the area and use limited interpretive signing, and allow placement of temporary wild horse traps if management objectives can be met (Actions 7340-7348). The Big Sandy Openings Management Area management will be designated, and management guidance will include designating as VRM Class II, designing any facilities for minimum surface disturbance, NSO for fluid minerals, petition to segregate and pursue mineral location withdrawal, close to mineral materials and solid mineral leasing, and designating it as a ROW exclusion area (Actions 7355-7358).

The management actions in the management areas section of this RMP revision/EIS provide guidance for managing both the areas and any activities that might occur in them. These actions do not authorize any surface disturbing or disruptive activities, and none of these areas contain identified Canada lynx habitat, so no impacts to Canada lynx or their habitat is expected within the planning area.

Management actions in the ACEC section of the special designations program include protecting and enhancing the relevant and important values, allowing activities on a case-by-case basis that conform to objectives, analyze and prioritizing any increases in vegetation production for watershed stabilization and improvement, wildlife forage, before considering livestock, and restricting heavy firefighting equipment to designated roads and trails, unless protecting life, property, and resource values (Actions 7400-7403). Management guidance specific to the Cedar Canyon ACEC includes; retain the ACEC designation, close mineral leasing, manage vegetation to enhance habitat for wildlife, protect and manage occupied and historic raptor nesting sites, determine, on a case-by-case basis, the appropriate level of protection, prohibit wood cutting and the removal of other special forest products, prohibit motorized and non-

motorized vehicle travel, designate the ACEC as VRM class II, prepare a reclamation plan for existing disturbed area, require reclamation, consider livestock water developments only if habitat and resource conditions would be improved or maintained, manage the Cedar Canyon Petroglyph rock art site and the surrounding setting (within 3 miles) to protect the cultural and historical values, prohibit any activities or ancillary facilities related to either surface or subsurface mining, surface disturbing activities, visual intrusions, and audible intrusions, within these areas, manage as closed to mineral material sales, the use of explosives and vibroseis operations, the use of fire retardant chemicals within ¼ mile of the sites, and pursue withdrawal from mineral location and entry under the land laws (Actions 7404 – 7417). Management guidance specific to the Greater Red Creek ACEC include retaining the ACEC designation and expanding to include Sugarloaf and Salt Wells Management Areas (Action 7418), manage the Sage, Currant and Red Creek portions in support of watershed stability and Colorado River cutthroat trout habitat management objectives (Action 7419), HMP revision should be ecosystem based. Develop and implement an HMP focused on multiple aquatic and terrestrial wildlife species assemblages and their habitats., close to fluid mineral leasing, petition to segregate and pursue withdrawal from mineral location, close to mineral material sales and solid mineral leasing, designate as a ROW exclusion area for new rights-of-way, designate as VRM Class II, Modify livestock grazing objectives and systems to manage for plant condition and composition most ecologically beneficial to identified wildlife species, while also considering the habitat of other species., prohibit activities that preclude the achievement or maintenance of the Wyoming Land Health Standards as a minimum, manage forested areas primarily toward meeting riparian, watershed, and other objectives, evaluate on a case-by-case basis, fire management, suppression needs, and prescribed burning in timer stands to ensure stands are maintained in healthy condition, and allow onsite recreation controls and facilities only for resource protection and the safety of users, limit motorized vehicle use to designated roads and trails, apply a no net gain in roads, (Actions 7418-7430). In addition to the management for the Greater Red Creek ACEC as a whole, management specific to the Sage Creek portion includes designate the area as VRM Class II and prohibit livestock grazing in the portion of the Mellor Mountain grazing allotment that intersects the Sage Creek portion of the ACEC (7432-7433). Management specific to the Currant Creek portion of the ACEC includes designate the area as VRM Class II, limit fire suppression activities, and prohibit livestock grazing in the Jane's Meadow and upper Currant Creek Pastures (7434-7438). Management specific to the Red Creek Portion of the Greater Red Creek ACEC includes designate the area as VRM Class II, manage to minimize accelerated erosion and increased sedimentation into the Green River, prohibit livestock grazing in the Red Creek Allotment, allow motorized travel only for access to state/private parcels, and pursue acquisition of the state parcel (7439 – 7445). Management guidance specific to the Greater Sand Dunes ACEC includes; retain the ACEC designation boundaries, designate as VRM Class II, designate the Greater Sand Dunes area and public land within one mile or the visual horizon, whichever is closer, as a ROW avoidance area, close to mineral material sales, close the western portion of the Greater Sand Dunes ACEC to coal leasing, manage to protect and improve the dunal ponds and retain the Tri-Territory backcountry byway designation (7446 – 7454). Other management includes managing the relatively pristine portion of the eastern area to protect big game habitat, vegetation communities, and visual and recreation resources (Action 7464). Activities would not be permitted to disrupt access or use of the developed recreation sites, and activities that are incompatible with recreation sites would be managed to avoid those sites(7465). Management would also include: restrict activities seasonally on crucial big game winter ranges, big game birthing areas, and sage-grouse nesting habitat and winter concentration areas, require closed loop drilling systems, prohibit reserve pits, do not allow dune ponds to be used as water sources for development, designate the eastern portion as a right-of-way exclusion area, designate active sand dune areas as open to off-road vehicles, and limit offroad travel on stabilized dunes to existing roads and trails (7463 – 7470)..Management for the Boars Tusk portion of the Greater Sand Dunes ACEC includes: retain a ACEC designation, manage as an exclusion area for ROWs, close the area to mineral location, mineral material sales and leasable minerals, pursue a withdrawals, limit surface disturbing activities, discourage OHV use, prohibit facilities on talus slopes, continue to close to climbing activities, close and reclaim the road around the geologic feature, designate as a VRM Class II, restrict surface disturbing activities seasonally on crucial areas. (Actions 7455-7462). Management guidance specific to the Crookston Ranch portion of the Greater Sand Dunes

ACEC include: retain as part of the ACEC, designate as an exclusion area for rights-of-ways, close to mineral location, mineral material sales, and leasable minerals, limit surface disturbance activities, suppress fires, and prohibit off-highway vehicle use (Actions 7471 – 7476). Management guidance specific to the Natural Corrals ACEC include: retain the ACEC, close it to fluid mineral exploration and development, prohibit surface disturbing activities, close to mineral materials sales, allow solid leasable mineral mining by subsurface methods only, designate as a ROW exclusion area, retain the mineral location withdrawal, designate as VRM Class II, close prehistoric site to OHV use, vehicles used for geophysical activities, over the snow vehicles, use of explosives and blasting, and allow placement of temporary wild horse traps provided the management actions of the area can be met (Actions 7477-7485). Management guidance specific to the Oregon Buttes ACEC include: retain the ACEC designation, designate as a rights-of-way exclusion area, close to mineral material sales, mineral exploration and development activities, prohibit OHV use for any purpose, and designate as VRM Class II (Actions 7486-7489). Management guidance specific to the Pine Springs ACEC include: retain the ACEC and expand its boundaries, , prohibit surface disturbing activities, , retain the withdrawal from mineral location, close to mineral material sales and solid mineral leasing, designate as a ROW exclusion area, close to geophysical operations and the use of blasting and explosives, allow consideration of fencing and other barriers to ensure protection to the area, close to additional spring development, and designate as VRM Class II (Actions 7490-7497). Management guidance specific to the South Pass Historic Landscape ACEC include: retain and expand the ACEC designation, protect the scenic values along Highway 28, require mitigation to protect the scenic and historic values. Designate areas as VRM Class II, manage the South Pass Historic Landscape portion of the ACEC to encompass the setting along the Oregon, Mormon Pioneer, California, and Pony Express trails and the Lander Cutoff, , allow activities to ensure protection, designate as VRM Class I and II, designate as an exclusion area for rights-of-way and surface disturbing activities, close the area to leasable minerals and mineral material sales, limit vehicle use to designated roads and trails, allow placement of temporary wild horse traps provided the management objectives of the area can be met, leave most of the ACEC open to exploration and development of locatable minerals, mitigate affects to the viewshed (Actions 7498-7507). Management actions specific to the Special Status Plant Species ACEC include retaining the ACEC and expand it (7508-7509). Other management includes: designate as an exclusion area, stipulate as an NSO and surface disturbing activities for leasable mineral activities, close to mineral material sales and use of explosives and blasting, designate as limited to designated roads and trails, close to any surface disturbing fire suppression activities unless necessary for species survival. Wild horse management in the area would be consistent with wild horse herd management plans and management objectives for this area. Barriers for the purpose of ensuring protection of the plant species would be considered for both known and potential habitat areas (Actions 7508-7515). Management actions specific to the Steamboat Mountain ACEC include retaining the ACEC and expanding (Action 7516). Other management include: priority consideration on relevance and importance values, designate as an exclusion area, designate as an NSO. Close to mineral material sales and use of explosives and blasting, consider leasing and development of federal coal in the area only for subsurface mining methods, ensure adequate measures are taken to protect and maintain the elk herd and its, open the ACEC to actions that would enhance the management objectives for the area. Actions that could be considered include fencing, interpretive signs, or construction of vehicle barriers, apply appropriate surface use and seasonal restrictions, designate as an exclusion area for rights-of-way, Allow vehicle travel on designated roads, designate as VRM Class I and II objectives (Actions 7516-7529). Management actions specific to the White Mountain Petroglyphs ACEC include: retain the ACEC designation, ensure protection of the site, designate the as an exclusion area, retain the existing withdrawal, and close the area to mineral material sales (Actions 7530 – 7532). Other management includes; designate as VRM Class II, allow geophysical activities provided they are at least one mile from the rock art site, prohibit other kinds of activities if the sacred Native American values would be adversely affected, Manage petroglyphs and the surrounding setting (within three miles) to protect its cultural and historical values, designate lands visible within a three-mile radius as open for consideration of activities to ensure protection to the rock art site, , close the ACEC to vehicle travel (Actions 7533 – 7537). Management actions specific to the South Wind River ACEC include; designate as an ACEC, prohibit surface disturbing activities or facilities on or within three

miles of the trail or the Visual Horizon of the Continental Divide National Scenic Trail, the Continental Divide Snowmobile trail, and the South Pass Cross Country Ski Trail, designate as VRM Class II, designate the ACEC an exclusion area to mineral material sales, close to mineral leasing, limit vehicle use to designated roads and trails, apply surface use restrictions, and (Actions 7538-7547). Management actions specific to the East Sand Dunes-Red Lakes ACEC include; designate as an ACEC, designate the area as VRM Class II, minimize surface disturbance, designate as an exclusion area for right-of-way and surface disturbing activities, close the area to mineral material sales and mineral leasing, manage vegetative resources in the area, limit vehicle use to designated roads and trails (Actions 7548 – 7554). Management actions for the Big Game Migration Corridor include; designate as an ACEC, prohibit surface disturbing activities or facilities, designate as VRM II, designate as an exclusion area for right-of-way, close the area to mineral material sales and mineral leasing, manage for no-net-loss or habitat and to retain habitat function, limit vehicle use to designated roads and trails (Actions 7555, 7562). Management Actions for the Big Sandy Openings ACEC include; Designate as an ACEC, designate as VRM Class II, minimize surface disturbance, designate the ACEC an exclusion area for ROWs, surface disturbing activities mineral material sales, and mineral location, close the area to mineral leasing, and limit vehicle use to designated roads and trails (Actions 7563-7567). Management specific to National Historic Landmarks would use the same boundary as the South Pass Historic Landscape ACEC, until a formal NHL boundary is designated (Action 7570).

### **Socioeconomic**

Management actions for the socioeconomic resources program include reducing or minimizing risk to humans and the environment from hazardous materials on BLM-administered lands within the planning area, preventing waste contamination due to BLM-authorized actions, integrating hazardous materials and waste management policies and controls into all BLM programs, manage risks to public health, safety and environment posed by human-caused hazards and/or geologic hazards on the National System of Public Lands, reduce or eliminate hazards, where possible, from abandoned mine lands, collaborate with Wyoming Department of Environmental Quality (WDEQ) for abandoned mine land sites, Manage risk to public safety and the environment associated with hazardous substances, wastes, and materials to ensure restoration of contaminated lands and carry out response activities, test pits associated with oil and gas activities that contain produced water or drilling fluids at well sites or other locations for TCLP constituents, operator will pay costs for testing and proper disposal, identify Abandoned Mine Lands sites with warning signage and consider adding protective fencing where appropriate. (Actions 8000-8007).

## **H.4.1 Canada Lynx (*Lynx canadensis*)—Threatened**

### **Effects of Selected Alternative**

#### **Physical Resources**

The physical resources program includes management actions for air quality, soil, geologic, water, and lands with wilderness characteristics.

Management actions in the RMP revision/EIS Preferred Alternative for air quality include those related to monitoring and analyses, as well as dust abatement and would have no impacts to Canada lynx.

The management actions for soil and geologic resources in this RMP revision/EIS provide management guidance for protecting and monitoring erosion, sedimentation, and other areas related to soil and geologic resources. These actions do not authorize any activities that would impact Canada lynx or their habitat.

The management actions for the water resources section of this RMP revision/EIS provide management guidance for the protections and management of surface and ground water within the planning area. These actions do not authorize any activities that would impact Canada lynx or its habitat, so no impacts are anticipated.

Management actions in the RMP/EIS Preferred Alternative for lands with wilderness characteristics (deal with acquisition and/or general management of the identified areas and will have no impacts on Canada lynx.

### **Mineral Resources**

Management actions in the RMP/EIS Preferred Alternative for locatable minerals do not authorize any activities that would have impacts on Canada lynx or their habitat.

The management actions for leasable minerals in this RMP revision/EIS provide guidance for managing leasing and project development within the planning area. These actions do not authorize any surface disturbing or disruptive activities, and other actions throughout the RMP revision/EIS restrict or close areas within lynx habitat to leasable minerals, and no impacts to Canada lynx or their habitat will occur from these actions.

The management actions for salable minerals in this RMP revision/EIS provide guidance for managing permitting and project development within the planning area. These actions do not authorize any surface disturbing or disruptive activities, and other actions throughout the RMP revision/EIS restrict or close areas within lynx habitat to leasable minerals, and no impacts to Canada lynx or their habitat will occur from these actions.

### **Fire and Fuels Management**

The management actions in the fire and fuels program of this RMP revision/EIS provide management guidance for wildfire suppression and fuels treatment activities, while protecting other resource values. Although these actions do not authorize any activities, the use of heavy equipment during wildfire suppression, and the removal of trees and understory during fuels treatment projects may have an impact on Canada lynx and their habitat.

### **Biological Resources**

Changes to management of forest and woodlands in this RMP revision/EIS are designed to minimize impacts to other resources. However, forest and woodland management activities within the planning area may have impacts to Canada lynx through removal of trees and understory in lynx habitat, which may alter or restrict movement of lynx and/or its prey.

Changes to management of grassland and shrubland communities in this RMP revision/EIS are designed to minimize impacts to resources and would occur in areas not identified as lynx habitat. There will be no impacts to Canada lynx or their habitat from the management actions related to grassland and shrubland communities.

The invasive species and pest management actions in this RMP revision/EIS are designed provide for control of these species while minimizing impacts to other resources. Because application of chemicals and other methods to control invasive species and pests under these management actions would be a very specific, defined, site-specific process, no impacts to Canada lynx from these management actions are

expected.

The management actions for Riparian and Wetland Resources provide guidance for managing, improving and restoring habitats, and will have no impacts to Canada lynx or their habitat.

The management actions in the general wildlife section of this revision are designed to provide protections and generally guide management of wildlife habitat in the planning area. The management actions in this section are general, and more specific management actions will be discussed in the following sections, so no impacts to Canada lynx are anticipated from these actions.

The management actions in the big game portion of the fish and wildlife section of this revision are designed to provide protections to important winter and parturition habitat for big game. These habitats overlap identified lynx habitats within the planning area and would minimize any impacts to Canada lynx by limiting disturbance, especially during the crucial winter months.

The management actions in the raptor portion of the fish and wildlife section of this revision are designed specifically to provide protections to nesting raptors, and they will have no impacts on Canada lynx.

The management actions in the fish portion of the fish and wildlife section of this revision are designed specifically to provide protections for fish species and their habitats and will have no impacts on Canada lynx.

The management actions in the special status plants portion of the biological resources program in this RMP revision/EIS are designed to specifically provide protections for special status plants. These actions should have no impacts on Canada lynx.

The management actions in the special status species, wildlife and fisheries portion of this RMP revision/EIS are designed to provide protections for special status wildlife and fish species. This includes threatened and endangered species, such as the Canada lynx. These actions do not authorize any activities that would cause disturbance or disruption to Canada lynx or their habitat, therefore, there would be no impacts from these actions.

The management actions in the wild horse portion of biological resources are designed to provide for the management of the Little Colorado HMA. This HMA does not contain habitat for Canada lynx, so there will be no impacts to lynx from these actions.

### **Heritage and Visual Resources**

The management actions in the cultural section of this RMP revision/EIS are designed to provide protection for specific sites and specific resources. These actions do not authorize any surface disturbing or disruptive activities and should have no impacts on Canada lynx.

The management actions in the paleontological section of this RMP revision/EIS are designed to provide for protection and management of paleontological resources. No known sites exist within the identified lynx habitat in the planning area, so no impacts to Canada lynx are expected.

The management actions in the visual section of this RMP revision/EIS are designed to meet the specific requirements of the VRM Classes and will have no impacts to Canada lynx.

### **Land Resources**



The management actions in the lands and realty section of this RMP revision/EIS provide general management guidance for related actions while minimizing impacts to other resources. These actions are general and do not authorize any impacts that would affect Canada lynx.

The management actions in the renewable energy section of this RMP revision/EIS provide guidance for the approval and management of renewable energy development within the planning area. The portions of the planning area that contain identified lynx habitat are ROW exclusion or avoidance areas, so there would be no impacts to Canada lynx or their habitat from these actions.

The management actions in the ROW corridors section of this RMP revision/EIS provide management guidance for currently identified corridors, closure of existing corridors, and designation of new corridors. No identified or proposed corridors occur within lynx habitat, so there would be no impacts to Canada lynx.

The management actions in the Backcountry Byways section include guidance for retaining existing backcountry byways, and would have no impact on Canada lynx and their habitat.

The management actions in the livestock grazing management section in this RMP revision/EIS provide guidance for authorization and management of livestock grazing on lands within the planning area. Livestock grazing is permitted in lynx habitat within the planning area and may have some impacts through the removal of vegetation used as hiding cover for Canada lynx and their prey.

The management actions in the recreation section of this RMP revision/EIS provide guidance for management of recreation activities within the planning area, while providing for protections to other resource values. Overall the management actions will have no impacts to Canada lynx..

The management actions in the OHV section of this RMP revision/EIS provide guidance for managing OHV use within the planning area, including limiting use to designated roads and trails, as well as identifying closed and open area. Based on the management identified, there should be no impacts to Canada lynx.

### **Special Designations**

The management actions in the congressionally designated trails section of this RMP revision/EIS are meant to provide guidance for both the management of the trail corridors and any activities that are proposed within those corridors. These actions themselves do not authorize any activities that would have an impact on Canada lynx, so no impacts are expected to Canada lynx or their habitat within the planning area.

The management actions in the wilderness study area section of this RMP revision/EIS provide for future designations, as well as designation of their current VRM Class. None of these actions authorize any disturbing or disruptive activities and would have no impact on Canada lynx or their habitat within the planning area.

The management actions in the wild and scenic rivers section of this RMP revision/EIS provide guidance for the designation and management of those areas that meet the suitability factors. None of the management actions authorize any activities that would have an impact on Canada lynx, so no impacts are expected to Canada lynx or their habitat within the planning area.

The management actions in the management areas section of this RMP revision/EIS provide guidance for managing both the areas and any activities that might occur in them. These actions do not authorize any

surface disturbing or disruptive activities, and none of these areas contain identified Canada lynx habitat, so no impacts to Canada lynx or their habitat is expected within the planning area.

The management actions in the ACEC section of this RMP revision/EIS provide management guidance for designating and retaining the ACEC status and provide management guidance for activities within those areas. These actions do not authorize any surface disturbing or disruptive activities, and no impacts to Canada lynx or its habitat are expected within the planning area.

### **Socioeconomic**

The management actions in the socioeconomic resources program provide management guidance for protection of human health and the environment from hazardous resources and wastes, and for the consideration of socioeconomic impacts during project planning. These actions do not authorize any surface disturbing or disruptive activities and will have no impacts on Canada lynx or their habitat within the planning area.

### **Cumulative Effects**

Cumulative impacts, according to the ESA, Section 7 Consultation Handbook definition (USFWS 1998a) include the incremental impacts of future state or private activities (i.e., excluding federal activities) that are reasonably certain to occur within the action area of the federal action subject to consultation.

Existing and proposed activities on non-federal lands in the planning area that have the potential to cumulatively effect the species include but are not limited to the following:

- Non-federal oil and gas and related energy development
- Livestock grazing on private lands
- Timber harvesting on private lands
- Subdivision development
- Recreation
- Coal mine operations
- Transmission lines
- Seismic exploration.

Implementation of the RMP revision/EIS would not change any potential effects to the Canada lynx, or its habitat, that may result from current or projected future non-federal actions.

### **Effects Determination**

The effects determination addresses the Preferred Alternative for the Rock Springs Field Office RMP Revision/EIS. The RMP itself does not authorize any specific actions that would cause surface disturbance or disruption. Any proposed projects that may have an impact on threatened or endangered species would have consultation completed at that time. Other than the actions/programs discussed below, the actions in the RMP revision/EIS have been determined to have “No Effect” on Canada lynx. There is no critical habitat for Canada lynx in the RMP planning area.

Within the fire and fuels program, the use of heavy equipment for fire suppression, as well as the removal of vegetative cover during the completion of fuels projects, may have impacts to Canada lynx by removal of hiding cover for both the lynx and its prey species. Although there are several Lynx Analysis Units within the planning area, there is no designated critical habitat, and no lynx sightings have been reported in a number of years, so the impact would be expected to minimal, and a “May Affect, Not Likely to Adversely Affect” determination has been made.

Within the biological resources program, actions in the forest and woodlands section have been identified as potentially having an impact. Removal of vegetation during timber sale operations may reduce vegetative hiding cover for Canada lynx or their prey. Although there may be an impact, no critical habitat exists in the planning area, and any project that may be authorized would have consultation completed at that time. Any project completed on BLM-administered lands would have to be designed to minimize impacts to resources, including Canada lynx and their habitat. Based on these factors, a determination of “May Affect, Not Likely to Adversely Affect” has been made for the forest and woodlands management actions.

Within the land resources program, actions in the Continental Divide Snowmobile Trail SRMA would not be retained. However, the trail would still be open for over-the-snow vehicles and may have an impact by creating trails in the snow that would allow for prey to more easily escape from Canada lynx. Although this may be an impact, the trail occurs mostly on existing roads within the lynx habitat in the planning area, and impacts are anticipated to be minimal. Based on these factors, a determination of “May Affect, Not Likely to Adversely Affect” has been made for the actions for the Continental Divide Snowmobile Trail.

Within the land resources program, actions in the OHV section have been identified as potentially having an impact. Over-the-snow vehicles could still cause impacts similar to those listed above for the Continental Divide Trail SRMA. Based on those factors, a “May Affect, Not Likely to Adversely Affect” determination has been made for the OHV actions.

## **H.4.2 Grizzly Bear (*Ursus arctos horribilis*)—Threatened**

### **Effects of Selected Alternative**

#### **Physical Resources**

Management actions in the RMP revision/EIS Preferred Alternative for air quality include those related to monitoring and analyses, as well as dust abatement, and would have no impacts to grizzly bear

The management actions for soil and geologic resources in this RMP revision/EIS provide management guidance for protecting and monitoring erosion, sedimentation, and other areas related to soil and geologic resources. These actions do not authorize any activities that would impact grizzly bear or their habitat.

Management actions in the RMP/EIS Preferred Alternative for lands with wilderness characteristics (Actions 1500-1517) deal with acquisition and/or general management of the identified areas and will have no impacts on grizzly bear.

#### **Mineral Resources**

Management actions in the RMP/EIS Preferred Alternative for locatable minerals identify open and closed areas and do not authorize any activities that would have impacts on grizzly bear or their habitat.

The management actions for leasable minerals in this RMP revision/EIS provide guidance for managing leasing and project development within the planning area. These actions do not authorize any surface disturbing or disruptive activities, and other actions throughout the RMP revision/EIS restrict or close areas within the bear’s habitat to leasable minerals, and no impacts to grizzly bear or their habitat will occur from these actions.

The management actions for salable minerals in this RMP revision/EIS provide guidance for managing permitting and project development within the planning area. These actions do not authorize any surface disturbing or disruptive activities, and other actions throughout the RMP revision/EIS restrict or close areas within grizzly bear habitat to leasable minerals, and no impacts to grizzly bear or their habitat will occur from these actions.

### **Fire and Fuels Management**

The management actions in the fire and fuels program of this RMP revision/EIS provide management guidance for wildfire suppression and fuels treatment activities, while protecting other resource values. Although these actions do not authorize any activities, the use of heavy equipment during wildfire suppression, and the removal of trees and understory during fuels treatment projects may have an impact on grizzly bear and their habitat.

### **Biological Resources**

Changes to management of forest and woodlands in this RMP revision/EIS are designed to minimize impacts to other resources. However, forest and woodland management activities within the RMP planning area may have impacts to grizzly bear through removal of trees and understory in bear habitat, which may alter or restrict movement of grizzly bear.

Changes to management of grassland and shrubland communities in this RMP revision/EIS are designed to minimize impacts to resources and would occur in areas not identified as grizzly bear habitat. There will be no impacts to grizzly bear or their habitat from the management actions related to grassland and shrubland communities.

The invasive species and pest management actions in this RMP revision/EIS are designed provide for control of these species while minimizing impacts to other resources. Because application of chemicals and other methods to control invasive species and pests under these management actions would be a very specific, defined, site specific process, no impacts to grizzly bear from these management actions are expected.

The management actions in the general wildlife section of this RMP revision/EIS are designed to provide protections and generally guide management of wildlife habitat in the planning area. The management actions in this section are general, and more specific management actions will be discussed in the following sections, so no impacts to grizzly bear are anticipated from these actions.

The management actions in the big game portion of the fish and wildlife section of this RMP revision/EIS are designed to provide protections to important winter and parturition habitat for big game. These habitats overlap identified grizzly bear habitats within the planning area and would minimize any impacts to grizzly bear by limiting disturbance, especially during crucial time periods.

The management actions in the raptor portion of the fish and wildlife section of this revision are designed specifically to provide protections to nesting raptors, and they will have no impacts on grizzly bear and their habitat.

The management actions in the fish portion of the fish and wildlife section of this RMP revision/EIS are

designed specifically to provide protections for fish species and their habitats and will have no impacts on grizzly bear and their habitat.

The management actions in the special status plants portion of the biological resources program in this RMP revision/EIS are designed to specifically provide protections for special status plants. These actions should have no impacts on grizzly bear and their habitat.

The management actions in the special status species, wildlife and fisheries portion of this RMP revision/EIS are designed to provide protections for special status wildlife and fish species. This includes threatened and endangered species, such as the grizzly bear. These actions do not authorize any activities that would cause disturbance or disruption to grizzly bear or their habitat; therefore, there would be no impacts from these actions.

The management actions in the wild horse portion of biological resources are designed to provide for the management of designated HMAs. None of the HMAs within the planning area contain habitat for grizzly bear, so there will be no impacts from these actions.

### **Heritage and Visual Resources**

The management actions in the cultural section of this RMP revision/EIS are designed to provide protection for specific sites and specific resources. These actions do not authorize any surface disturbing or disruptive activities and should have no impacts on grizzly bear and their habitats.

The management actions in the paleontological section of this RMP revision/EIS are designed to provide for protection and management of paleontological resources. No known sites exist within the identified grizzly bear habitat in the planning area, so no impacts to grizzly bear or their habitats are expected.

The management actions in the visual section of this RMP revision/EIS are designed to meet the specific requirements of the VRM Classes and will have no impacts to grizzly bear or their habitats.

### **Land Resources**

The management actions in the lands and realty section of this RMP revision/EIS provide general management guidance for related actions while minimizing impacts to other resources. These actions are general and do not authorize any impacts that would affect grizzly bear or their habitats.

The management actions in the renewable energy section of this RMP revision/EIS provide guidance for the approval and management of renewable energy development within the planning area. The portions of the planning area that contain identified grizzly bear habitat are ROW exclusion or avoidance areas, so there would be no impacts to grizzly bear or their habitat from these actions.

The management actions in the ROW corridors section of this RMP revision/EIS provide management guidance for currently identified corridors, closure of existing corridors, and designation of new corridors. No identified or proposed corridors occur within grizzly bear habitat, so there would be no impacts to grizzly bear or their habitat.

The management actions for livestock grazing in this RMP revision/EIS provide guidance for authorization and management of livestock grazing on lands within the planning area. Livestock grazing is permitted in grizzly bear habitat within the planning area and may have some impacts through altering or restricting movement of grizzly bear.

The management actions in the recreation section of this RMP revision/EIS provide guidance for management of recreation activities within the planning area, while providing for protections to other resource values. Overall, the management actions will have no impacts to grizzly bear.

The management actions in the OHV section of this RMP revision/EIS provide guidance for managing OHV use within the planning area. Within identified habitats for lynx in the planning area, no vehicles would be allowed off of designated roads and there would be no impacts to grizzly bear or their habitats.

### **Special Designations**

The management actions in the congressionally designated trails section of this RMP revision/EIS are meant to provide guidance for both the management of the trail corridors and any activities that are proposed within those corridors. These actions themselves do not authorize any activities that would have an impact on grizzly bear, so no impacts are expected to grizzly bear or their habitat within the planning area.

The management actions in the wilderness study area section of this RMP revision/EIS provide for future designations of these areas if they are not designated as wilderness, as well as designation of their current VRM class. None of these actions authorize any disturbing or disruptive activities and would have no impact on grizzly bear or their habitat within the planning area.

The management actions in the wild and scenic rivers section of this RMP revision/EIS provide guidance for the designation and management of those areas that meet the suitability factors. None of the management actions authorize any activities that would have an impact on grizzly bear, so no impacts are expected to grizzly bear or their habitat within the planning area.

The management actions in the management areas section of this RMP revision/EIS provide guidance for managing both the areas and any activities that might occur in them. These actions do not authorize any surface disturbing or disruptive activities, and none of these areas contain identified grizzly bear habitat, so no impacts to grizzly bear or their habitat is expected within the planning area.

The management actions in the ACEC section of this RMP revision/EIS provide management guidance for designating and retaining the ACEC status and provide management guidance for activities within those areas. These actions do not authorize any surface disturbing or disruptive activities, and none of these ACECs contain identified grizzly bear habitat, so no impacts to grizzly bear or its habitat are expected

within the planning area.

### **Socioeconomic**

The management actions in the socioeconomic resources program provide management guidance for protection of human health and the environment from hazardous resources and wastes, and for the consideration of socioeconomic impacts during project planning. These actions do not authorize any surface disturbing or disruptive activities and will have no impacts on grizzly bear or their habitat within the planning area.

### **Cumulative Effects**

Cumulative impacts, according to the ESA, Section 7 Consultation Handbook definition (USFWS 1998a) include the incremental impacts of future state or private activities (i.e., excluding federal activities) that are reasonably certain to occur within the action area of the federal action subject to consultation.

Existing and proposed activities on non-federal lands in the planning area that have the potential to cumulatively affect the species include but are not limited to the following:

- Non-federal oil and gas and related energy development
- Livestock grazing on private lands
- Timber harvesting on private lands
- Subdivision development
- Recreation
- Coal mine operations
- Transmission lines
- Seismic exploration.

Implementation of the RMP revision would not change any potential effects to the grizzly bear, or its habitat, that may result from current or projected future non-federal actions.

### **Effects Determination**

The effects determination addresses the Preferred Alternative for the Rock Springs Field Office RMP Revision/EIS. The RMP itself does not authorize any specific actions that would cause surface disturbance or disruption. Any proposed projects that may have an impact on threatened or endangered species would have consultation completed at that time. Other than the actions/programs discussed below, the actions in the RMP revision/EIS have been determined to have “No Effect” on the grizzly bear.

Within the fire and fuels program, the use of heavy equipment for fire suppression, as well as the removal of vegetative cover during the completion of fuels projects, may have impacts to grizzly bear by removal of habitat and alteration or restriction of their movement. Any impact would be expected to be minimal, and a “May Affect, Not Likely to Adversely Affect” determination has been made.

Within the biological resources program, actions in the forest and woodlands section have been identified as potentially having an impact. Removal of vegetation during timber sale operations may reduce vegetative hiding cover for grizzly bear. Although there may be an impact, any project that may be authorized would have consultation completed at that time. Any project completed on BLM-administered lands would have to be designed to minimize impacts to resources, including grizzly bear and their habitat. Based on these factors, a determination of “May Affect, Not Likely to Adversely Affect” has been made for the forest and woodlands management actions.

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### H.4.3 North American Wolverine (*Gulo gulo luscus*)

#### Effects of Selected Alternative

##### Physical Resources

Management actions in the RMP revision/EIS Preferred Alternative for air quality include those related to monitoring and analyses, as well as dust abatement, and would have no impacts to wolverines.

The management actions for soil and geologic resources in this RMP revision/EIS provide management guidance for protecting and monitoring erosion, sedimentation, and other areas related to soil and geologic resources. These actions do not authorize any activities that would impact wolverines or their habitat.

Management actions in the RMP/EIS Preferred Alternative for lands with wilderness characteristics (Actions 1500-1517) deal with acquisition and/or general management of the identified areas and will have no impacts on wolverines.

##### Mineral Resources

Management actions in the RMP/EIS Preferred Alternative for locatable minerals identify open and closed areas and do not authorize any activities that would have impacts on wolverines or their habitat.

The management actions for leasable minerals in this RMP revision/EIS provide guidance for managing leasing and project development within the planning area. These actions do not authorize any surface disturbing or disruptive activities, and other actions throughout the RMP revision/EIS restrict or close areas within the wolverine's habitat to leasable minerals, and no impacts to wolverines or their habitat will occur from these actions.

The management actions for salable minerals in this RMP revision/EIS provide guidance for managing permitting and project development within the planning area. These actions do not authorize any surface disturbing or disruptive activities, and other actions throughout the RMP revision/EIS restrict or close areas within wolverine habitat to leasable minerals, and no impacts to wolverines or their habitat will occur from these actions.

##### Fire and Fuels Management

The management actions in the fire and fuels program of this RMP revision/EIS provide management guidance for wildfire suppression and fuels treatment activities, while protecting other resource values. Although these actions do not authorize any activities, the use of heavy equipment during wildfire suppression, and the removal of trees and understory during fuels treatment projects may have an impact on wolverines and their habitat.

##### Biological Resources

Changes to management of forest and woodlands in this RMP revision/EIS are designed to minimize impacts to other resources. However, forest and woodland management activities within the RMP planning area may have impacts to wolverines through removal of trees and understory in bear habitat, which may alter or restrict movement.



Changes to management of grassland and shrubland communities in this RMP revision/EIS are designed to minimize impacts to resources and would occur in areas not identified as wolverine habitat. There will be no impacts to wolverines or their habitat from the management actions related to grassland and shrubland communities.

The invasive species and pest management actions in this RMP revision/EIS are designed provide for control of these species while minimizing impacts to other resources. Because application of chemicals and other methods to control invasive species and pests under these management actions would be a very specific, defined, site specific process, no impacts to wolverines from these management actions are expected.

The management actions in the general wildlife section of this RMP revision/EIS are designed to provide protections and generally guide management of wildlife habitat in the planning area. The management actions in this section are general, and more specific management actions will be discussed in the following sections, so no impacts to wolverines or their habitat are anticipated from these actions.

The management actions in the big game portion of the fish and wildlife section of this RMP revision/EIS are designed to provide protections to important winter and parturition habitat for big game. These habitats overlap identified wolverine habitats within the planning area and would minimize any impacts to wolverines by limiting disturbance, especially during crucial time periods.

The management actions in the raptor portion of the fish and wildlife section of this revision are designed specifically to provide protections to nesting raptors, and they will have no impacts on wolverines and their habitat.

The management actions in the fish portion of the fish and wildlife section of this RMP revision/EIS are designed specifically to provide protections for fish species and their habitats and will have no impacts on wolverines and their habitat.

The management actions in the special status plants portion of the biological resources program in this RMP revision/EIS are designed to specifically provide protections for special status plants. These actions should have no impacts on wolverines and their habitat.

The management actions in the special status species, wildlife and fisheries portion of this RMP revision/EIS are designed to provide protections for special status wildlife and fish species. This includes threatened and endangered species, such as the wolverine. These actions do not authorize any activities that would cause disturbance or disruption to wolverines or their habitat; therefore, there would be no impacts from these actions.

The management actions in the wild horse portion of biological resources are designed to provide for the management of designated HMAs. None of the HMAs within the planning area contain habitat for wolverines, so there will be no impacts from these actions.

### **Heritage and Visual Resources**

The management actions in the cultural section of this RMP revision/EIS are designed to provide protection for specific sites and specific resources. These actions do not authorize any surface disturbing or disruptive activities and should have no impacts on wolverines and their habitats.

The management actions in the paleontological section of this RMP revision/EIS are designed to provide for protection and management of paleontological resources. No known sites exist within the identified wolverine habitat in the planning area, so no impacts to wolverines or their habitats are expected.

The management actions in the visual section of this RMP revision/EIS are designed to meet the specific requirements of the VRM Classes and will have no impacts to wolverines or their habitats.

### **Land Resources**

The management actions in the lands and realty section of this RMP revision/EIS provide general management guidance for related actions while minimizing impacts to other resources. These actions are general and do not authorize any impacts that would affect wolverines or their habitats.

The management actions in the renewable energy section of this RMP revision/EIS provide guidance for the approval and management of renewable energy development within the planning area. The portions of the planning area that contain identified wolverine's habitat are ROW exclusion or avoidance areas, so there would be no impacts to wolverines or their habitat from these actions.

The management actions in the ROW corridors section of this RMP revision/EIS provide management guidance for currently identified corridors, closure of existing corridors, and designation of new corridors. No identified or proposed corridors occur within wolverine's habitat, so there would be no impacts to wolverines or their habitat.

The management actions for livestock grazing in this RMP revision/EIS provide guidance for authorization and management of livestock grazing on lands within the planning area. Livestock grazing is permitted in wolverine habitat within the planning area and may have some impacts through altering or restricting movement of wolverines.

The management actions in the recreation section of this RMP revision/EIS provide guidance for management of recreation activities within the planning area, while providing for protections to other resource values. Overall, the management actions will have no impacts to wolverines.

The management actions in the OHV section of this RMP revision/EIS provide guidance for managing OHV use within the planning area. Within identified habitats in the planning area, no vehicles would be allowed off of designated roads and there would be no impacts to wolverines or their habitat.

### **Special Designations**

The management actions in the congressionally designated trails section of this RMP revision/EIS are meant to provide guidance for both the management of the trail corridors and any activities that are proposed within those corridors. These actions themselves do not authorize any activities that would have an impact on wolverines, so no impacts are expected to wolverines or their habitat within the planning area.

The management actions in the wilderness study area section of this RMP revision/EIS provide for future designations of these areas if they are not designated as wilderness, as well as designation of their current

VRM class. None of these actions authorize any disturbing or disruptive activities and would have no impact on wolverines or their habitat within the planning area.

The management actions in the wild and scenic rivers section of this RMP revision/EIS provide guidance for the designation and management of those areas that meet the suitability factors. None of the management actions authorize any activities that would have an impact on wolverines, so no impacts are expected to wolverines or their habitat within the planning area.

The management actions in the management areas section of this RMP revision/EIS provide guidance for managing both the areas and any activities that might occur in them. These actions do not authorize any surface disturbing or disruptive activities, and none of these areas contain identified wolverine habitat, so no impacts to wolverines or their habitat is expected within the planning area.

The management actions in the ACEC section of this RMP revision/EIS provide management guidance for designating and retaining the ACEC status and provide management guidance for activities within those areas. These actions do not authorize any surface disturbing or disruptive activities, and none of these ACECs contain identified wolverine habitat, so no impacts to wolverines or their habitat are expected within the planning area.

### **Socioeconomic**

The management actions in the socioeconomic resources program provide management guidance for protection of human health and the environment from hazardous resources and wastes, and for the consideration of socioeconomic impacts during project planning. These actions do not authorize any surface disturbing or disruptive activities and will have no impacts on wolverines or their habitat within the planning area.

### **Cumulative Effects**

Cumulative impacts, according to the ESA, Section 7 Consultation Handbook definition (USFWS 1998a) include the incremental impacts of future state or private activities (i.e., excluding federal activities) that are reasonably certain to occur within the action area of the federal action subject to consultation.

Existing and proposed activities on non-federal lands in the planning area that have the potential to cumulatively affect the species include but are not limited to the following:

- Non-federal oil and gas and related energy development
- Livestock grazing on private lands
- Timber harvesting on private lands
- Subdivision development
- Recreation
- Coal mine operations
- Transmission lines
- Seismic exploration.

Implementation of the RMP revision would not change any potential effects to the wolverines, or its habitat, that may result from current or projected future non-federal actions.

### **Effects Determination**

The effects determination addresses the Preferred Alternative for the Rock Springs Field Office RMP

Revision/EIS. The RMP itself does not authorize any specific actions that would cause surface disturbance or disruption. Any proposed projects that may have an impact on threatened or endangered species would have consultation completed at that time. Other than the actions/programs discussed below, the actions in the RMP revision/EIS have been determined to have “No Effect” on the wolverines.

Within the fire and fuels program, the use of heavy equipment for fire suppression, as well as the removal of vegetative cover during the completion of fuels projects, may have impacts to wolverines by removal of habitat and alteration or restriction of their movement. Any impact would be expected to be minimal, and a “May Affect, Not Likely to Adversely Affect” determination has been made.

Within the biological resources program, actions in the forest and woodlands section have been identified as potentially having an impact. Removal of vegetation during timber sale operations may reduce vegetative hiding cover for wolverines. Although there may be an impact, any project that may be authorized would have consultation completed at that time. Any project completed on BLM-administered lands would have to be designed to minimize impacts to resources, including wolverines and their habitat. Based on these factors, a determination of “May Affect, Not Likely to Adversely Affect” has been made for the forest and woodlands management actions.

#### **H.4.4 North Platte Species- Piping Plover (*Charadrius melodus*)—Endangered, Whooping Crane (*Grus americana*)—Endangered, Pallid Sturgeon (*Scaphirhynchus albus*)—Endangered, Western Prairie Fringed Orchid (*Platanthera praeclara*)—Endangered**

##### **Effects of Selected Alternative**

###### **Physical Resources**

Management actions in the RMP revision/EIS Preferred Alternative for air quality (1000-1017) would have no impacts to North Platte Species. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions for soil and geologic resources in this RMP revision/EIS provide management guidance for protecting and monitoring erosion, sedimentation, and other areas related to soil and geologic resources. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming that may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions in the water resources section of this RMP revision/EIS provide guidance for protecting and managing surface and ground water in the planning area. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

Management actions in the RMP/EIS Preferred Alternative for lands with wilderness characteristics deal with acquisition and/or general management of the identified areas. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

### **Mineral Resources**

Management actions in the RMP Preferred Alternative for locatable minerals identify open areas, and areas that withdrawal from locatable minerals will be pursued. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions for leasable minerals in this RMP revision/EIS provide guidance for managing leasing and project development within the planning area. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. Some of the changes in management, specifically the fluid minerals section, would cause water depletions or withdrawals as a result of these actions. Therefore, there may be impacts to the species or associated downstream designated critical habitat.

The management actions for salable minerals in this RMP revision/EIS provide guidance for managing permitting and project development within the planning area. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

### **Fire and Fuels Management**

The management actions in the fire and fuels program of this RMP revision/EIS provide management guidance for wildfire suppression and fuels treatment activities, while protecting other resource values. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

### **Biological Resources**

Changes to management of forest and woodlands in this RMP revision/EIS are designed to minimize impacts to other resources. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects

to the species or associated downstream designated critical habitats are anticipated.

Changes to management of grassland and shrubland communities in this RMP revision/EIS are designed to provide management guidance for these communities, including minimizing impacts to resources. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The invasive species and pest management actions in this RMP revision/EIS are designed provide for control of these species while minimizing impacts to other resources. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions in the general wildlife section of this revision are designed to provide protections and generally guide management of wildlife habitat in the planning area. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions in the big game portion of the fish and wildlife section of this revision are designed to provide protections to important winter and parturition habitat for big game. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions in the raptor portion of the fish and wildlife section of this revision are designed specifically to provide protections to nesting raptors. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions in the fish portion of the fish and wildlife section of this RMP revision/EIS are designed specifically to provide protections for fish species and their habitats. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are

anticipated.

The management actions in the special status plants portion of the biological resources program in this revision are designed to specifically provide protections for special status plants. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions in the special status species, wildlife and fisheries portion of this RMP revision/EIS are designed to provide protections for special status wildlife and fish species. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions in the wild horse portion of the biological resources are designed to provide for the management of designated HMAs. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

### **Heritage and Visual Resources**

The management actions in the cultural section of this RMP revision/EIS are designed to provide protection for specific sites and specific resources. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions in the paleontological section of this RMP revision/EIS are designed to provide for protection and management of paleontological resources. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions in the visual section of this RMP revision/EIS are designed to meet the specific requirements of the VRM Classes. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

### **Land Resources**

The management actions in the lands and realty section of this RMP revision/EIS provide general management guidance for related actions while minimizing impacts to other resources. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions in the renewable energy section of this RMP revision/EIS provide guidance for the approval and management of renewable energy development within the planning area. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions in the ROW corridors section of this RMP revision/EIS provide management guidance for currently identified corridors, closure of existing corridors, and designation of new corridors. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions for livestock grazing management in this RMP revision/EIS provide guidance for authorization and management of livestock grazing on lands within the planning area. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. Some of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, there may be impacts to the species or associated downstream designated critical habitats. Specifically, water developments authorized as part of livestock grazing management may have minor associated water withdrawals.

The management actions in the recreation section of this RMP revision/EIS provide guidance for management of recreation activities within the planning area, while providing for protections to other resource values. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming, may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions in the OHV section of this RMP revision/EIS provide guidance for managing OHV use within the planning area. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.



### **Special Designations**

The management actions in the congressionally designated trails section of this RMP revision/EIS are meant to provide guidance for both the management of the trail corridors and any activities that are proposed within those corridors. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions in the wilderness study area section of this RMP revision/EIS provide for future designations of these areas if they are not designated as wilderness, as well as designation of their current VRM Class. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions in the wild and scenic rivers section of this RMP revision/EIS provide guidance for the designation and management of those areas that meet the suitability factors. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions in the management areas section of this RMP revision/EIS provide guidance for managing both the areas and any activities that might occur in them. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

The management actions in the ACEC section of this RMP revision/EIS provide management guidance for designating and retaining the ACEC status and provide management guidance for activities within those areas. None of the Platte River species or their designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

### **Socioeconomic**

The management actions in the socioeconomic resources program provide management guidance for protection of human health and the environment from hazardous resources and wastes, and for the consideration of socioeconomic impacts during project planning. None of the Platte River species or their

designated critical habitat occur within Wyoming. The primary concern with these species is water depletions which occur in Wyoming may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of these actions would cause water depletions or withdrawals. Therefore, no effects to the species or associated downstream designated critical habitats are anticipated.

### **Cumulative Effects**

Cumulative impacts, according to the ESA, Section 7 Consultation Handbook definition (USFWS 1998a) include the incremental impacts of future state or private activities (i.e., excluding federal activities) that are reasonably certain to occur within the action area of the federal action subject to consultation.

Existing and proposed activities on non-federal lands in the planning area that have the potential to cumulatively affect the Platte River species within the state of Wyoming which contain water depletions include but are not limited to the following:

- Water irrigation diversions
- Construction of dams
- Consumptive water use
- Introductions of non-aquatic species
- Regulated water flow.

Implementation of the RMP revision/EIS would not change any potential effects to the Platte River species that may result from current or projected future non-federal actions.

### **Effects Determination**

The effects determination addresses the Preferred Alternative for the Rock Springs Field Office RMP Revision/EIS. The RMP itself does not authorize any specific actions that would cause water withdrawal or depletion from the North Platte River system. No critical habitat for the Platte River species is specifically designated in Wyoming. The Platte River species, the least tern, pallid sturgeon, Western prairie fringed orchid, and whooping crane are not known to occur in Wyoming. In addition, the piping plover is considered a rare or accidental visitor to the state of Wyoming.

Implications for the species and their critical habitats are downstream due to effects from water depletions or withdrawals. When water depletions or withdrawals occur, the BLM and USFWS notify the Wyoming State Engineers Office (SEO) when depletions are slated to occur to ensure an appropriate accounting of all water depletions. Approvals of the SEO are obtained in advance of concluding Section 7 consultation. Except for the actions discussed below, it has been determined that the management actions for this RMP revision/EIS would have “No Effect” on the North Platte Species.

Water withdrawals or depletions may occur as a result of the actions allowing for fluid mineral leasing and subsequent development activities. Given the state of the North Platte species, and the cumulative depletions on other lands, these actions “May Affect, Likely to Adversely Affect” these species. For any projects that cause depletions to the North Platte River system, at the time a project is proposed and analyzed, Section 7 consultation will be completed for that specific project/withdrawals. The Reasonably Foreseeable Development analysis conducted as part of the RMP revision/EIS process, predicts that approximately 6,300 wells could be drilled during the implementation period of the RMP. A number of these wells have previously been consulted on, and most would occur outside the North Platte River system. It is also expected that a fair percentage of the wells would be infill to existing fields. Based on these factors, it can be estimated that approximately greater than 100 wells would be drilled that would cause depletions to the North Platte River system. Individual wells use water at differing rates; however, based on previous depletion amounts it can be anticipated that each well would use approximately 0.65 acre feet of water for

a total of approximately 65 acre feet over the RMP period. As previously stated, any projects with new water depletions would be consulted on at the project level.

Water withdrawals or depletions may occur as a result of the actions associated with livestock grazing management. This would mainly occur with water development projects. Given the state of the North Platte species, and the cumulative depletions on other lands, these actions “May Affect, Likely to Adversely Affect” these species. For any projects that cause depletions to the North Platte River system, at the time a project is proposed and analyzed, Section 7 consultation will be completed for that specific project/withdrawal. At this time, there is very limited related development planned or anticipated that would cause a significant depletion from the North Platte System, so it is expected that depletions to the river system would be minor (greater than one acre feet per year).

#### **H.4.5 Endangered Colorado Fish Species: Bonytail (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), Humpback chub (*Gila cypha*), and Razorback sucker (*Xyrauchen texanus*)—Endangered**

##### **Effects of Selected Alternative**

###### **Physical Resources**

Management actions in the RMP revision/EIS Preferred Alternative for air quality would have no impacts to Colorado River fish species. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions for soil and geologic resources in this RMP revision/EIS provide management guidance for protecting and monitoring erosion, sedimentation, and other areas related to soil and geologic resources. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the water resources section of this RMP revision/EIS provide guidance for protecting and managing surface and ground water in the planning area. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

Management actions in the RMP/EIS Preferred Alternative for lands with wilderness characteristics deal with acquisition and/or general management of the identified areas. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

## **Mineral Resources**

Management actions in the RMP/EIS Preferred Alternative for locatable minerals identify areas open, and areas that withdrawal from locatable minerals will be pursued. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions for leasable minerals in this RMP revision/EIS provide guidance for managing leasing and project development within the planning area. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. Some of the changes in management, specifically the fluid minerals section, would cause water depletions or withdrawals as a result of these actions. Therefore, there may be impacts to the species or associated downstream designated critical habitats.

The management actions for salable minerals in this RMP revision/EIS provide guidance for managing permitting and project development within the planning area. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

## **Fire and Fuels Management**

The management actions in the fire and fuels program of this RMP revision/EIS provide management guidance for wildfire suppression and fuels treatment activities, while protecting other resource values. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

## **Biological Resources**

Changes to management of forest and woodlands in this RMP revision/EIS are designed to minimize impacts to other resources. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

Changes to management of grassland and shrubland communities in this RMP revision/EIS are designed to provide management guidance for these communities, including minimizing impacts to these and other

resources. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The invasive species and pest management actions in this RMP revision/EIS are designed provide for control of these species while minimizing impacts to other resources. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the general wildlife section of this RMP revision/EIS are designed to provide protections and generally guide management of wildlife habitat in the planning area. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the big game portion of the fish and wildlife section of this RMP revision/EIS are designed to provide protections to important winter and parturition habitat for big game. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the raptor portion of the fish and wildlife section of this RMP revision/EIS are designed specifically to provide protections to nesting raptors. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the fish portion of the fish and wildlife section of this RMP revision/EIS are designed specifically to provide protections for fish species and their habitats. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the special status plants portion of the biological resources program in this RMP revision/EIS are designed to specifically provide protections for special status plants. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern

with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the special status species, wildlife and fisheries portion of this RMP revision/EIS are designed to provide protections for special status wildlife and fish species. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the wild horse portion of biological resources are designed to provide for the management of designated HMAs. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

### **Heritage and Visual Resources**

The management actions in the cultural section of this RMP revision/EIS are designed to provide protection for specific sites and specific resources. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the paleontological section of this RMP revision/EIS are designed to provide for protection and management of paleontological resources. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the visual section of this RMP revision/EIS are designed to meet the specific requirements of the VRM Classes. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

### **Land Resources**

The management actions in the lands and realty section of this RMP revision/EIS provide general management guidance for related actions while minimizing impacts to other resources. No critical habitat

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for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the renewable energy section of this RMP revision/EIS provide guidance for the approval and management of renewable energy development within the planning area. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the ROW corridors section of this RMP revision/EIS provide management guidance for currently identified corridors, closure of existing corridors, and designation of new corridors. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the livestock grazing management in this RMP revision/EIS provide guidance for authorization and management of livestock grazing on lands within the planning area. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The

primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. Some of the changes in management would cause water depletions or withdrawals as a result of these actions. Therefore, there may be impacts to the species or associated downstream designated critical habitats. Specifically, water developments authorized as part of livestock grazing management may have minor associated water withdrawals.

The management actions in the recreation section of this RMP revision/EIS provide guidance for management of recreation activities within the planning area, while providing for protections to other resource values. No critical habitat for the endangered Colorado River fish species is specifically

designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the OHV section of this RMP revision/EIS provide guidance for managing OHV use within the planning area. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

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## Special Designations

The management actions in the congressionally designated trails section of this RMP revision/EIS are meant to provide guidance for both the management of the trail corridors and any activities that are proposed within those corridors. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the wilderness study area section of this RMP revision/EIS provide for future designations of these areas if they are not designated as wilderness, as well as designation of their current VRM Class. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the wild and scenic rivers section of this RMP revision/EIS provide guidance for the designation and management of those areas that meet the suitability factors. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the management areas section of this RMP revision/EIS provide guidance for managing both the areas and any activities that might occur in them. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

The management actions in the ACEC section of this RMP revision/EIS provide management guidance for designating and retaining the ACEC status and provide management guidance for activities within those areas. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

## Socioeconomic

The management actions in the socioeconomic resources program provide management guidance for protection of human health and the environment from hazardous resources and wastes, and for the consideration of socioeconomic impacts during project planning. No critical habitat for the endangered Colorado River fish species is specifically designated in Wyoming. The primary concern with the Colorado River fish species is water depletions which occur in Wyoming and may cause effects to the species



downstream in their respective habitats. None of the changes in management as a result of actions included in the RMP revision/EIS would cause water depletions or withdrawals. Therefore, no effects to the species are anticipated.

### **Cumulative Effects**

Cumulative impacts, according to the ESA, Section 7 Consultation Handbook definition (USFWS 1998a) include the incremental impacts of future state or private activities (i.e., excluding federal activities) that are reasonably certain to occur within the action area of the federal action subject to consultation.

Existing and proposed activities on non-federal lands in the planning area that have the potential to cumulatively affect the four endangered Colorado River fish species within the state of Wyoming which contain water depletions include but are not limited to the following:

- Water irrigation diversions
- Construction of dams
- Consumptive water use
- Introductions of non-aquatic species
- Regulated water flow.

Implementation of the RMP revision/EIS would not change any potential effects to the Colorado River species that may result from current or projected future non-federal actions.

### **Effects Determination**

The effects determination addresses the Preferred Alternative for the Rock Springs Field Office RMP Revision. The RMP itself does not authorize any specific actions that would cause water withdrawal or depletion from the Colorado River System. No critical habitat for the four endangered Colorado River fish species is specifically designated in Wyoming. The USFWS, in accordance with the Upper Colorado River Endangered Fish Recovery Program, adopted a *de minimis* policy, which states that water-related activities in the Upper Colorado River Basin that result in less than 0.1 acre-foot per year of depletions in flow have no effect on the Colorado River endangered fish species, and thus do not require consultation for potential effects on those species.

Except for the actions discussed below, it has been determined that the management actions for this RMP revision/EIS would have “No Effect” on the Colorado River fish species.

Water withdrawals or depletions may occur as a result of the actions allowing for fluid mineral leasing and subsequent development activities. Given the state of the endangered Colorado River fishes, and the cumulative depletions on other lands, these actions “May Affect, Likely to Adversely Affect” these species and their critical habitat. For any projects that cause depletions to the Colorado River system, at the time a project is proposed and analyzed, Section 7 consultation will be completed for that specific project/withdrawal. The Reasonably Foreseeable Development analysis conducted as part of the RMP revision/EIS process, predicts that approximately 6,300 wells could be drilled during the implementation period of the RMP. A number of these wells have previously been consulted on, and some occur outside the Colorado River system. It is also expected that a fair percentage of the wells would be infill to existing fields. Based on these factors, it can be estimated that approximately 3,000 wells would be drilled that would cause depletions to the Colorado River system. Individual wells use water at differing rates, however, based on previous depletion amounts it can be anticipated that each well would use approximately 0.65 acre feet of water for a total of approximately 1,950 acre feet over the RMP period. As previously stated, any projects with new water depletions would be consulted on at the project level.

Water withdrawals or depletions may occur as a result of the actions associated with livestock grazing

management. This would mainly occur with water development projects. Given the state of the endangered Colorado River species, and the cumulative depletions on other lands, these actions “May Affect, Likely to Adversely Affect” these species. For any projects that cause depletions to the Colorado River system, at the time a project is proposed and analyzed, Section 7 consultation will be completed for that specific project/withdrawal. At this time there is very limited related development planned or anticipated that would cause a significant depletion from the Colorado River system, so it is expected that depletions to the river system would be minor (greater than one acre feet per year).

## **H.4.6 Western Yellow-billed Cuckoo (*Coccyzus americanus*)—Threatened**

### **Effects of Selected Alternative**

#### **Physical Resources**

Management actions in the RMP revision/EIS Preferred Alternative for air quality would have no impacts to the western yellow-billed cuckoo or its proposed critical habitat. Actions in the air quality program include those related to monitoring and analyses, as well as dust abatement.

The management actions for soil and geologic resources in this RMP revision/EIS provide management guidance for protecting and monitoring erosion, sedimentation, and other areas related to soil and geologic resources. These actions do not authorize any activities that would impact western yellow-billed cuckoo or their proposed critical habitat.

The management actions for the water resources section of this RMP revision/EIS provide management guidance for the protection and improvement of water resources within the planning area. These actions do not authorize any actions that would impact western yellow-billed cuckoo or their proposed critical habitat.

Management actions in the RMP/EIS Preferred Alternative for lands with wilderness characteristics deal with acquisition and/or general management of the identified areas, none of which contain habitat, and will have no impacts on western yellow-billed cuckoo or its proposed critical habitat.

#### **Mineral Resources**

Management actions in the RMP/EIS Preferred Alternative for locatable minerals identify areas open, and areas that withdrawal from locatable minerals will be pursued. These management actions do not authorize any activities that would have impacts on western yellow-billed cuckoo or its proposed critical habitat.

The management actions for leasable minerals in this RMP revision/EIS provide guidance for managing leasing and project development within the planning area. These actions do not authorize any surface disturbing or disruptive activities; however, some of the associated activities may have impacts to cuckoos or their proposed habitat. Some actions may benefit the species through restrictions of roads, or other activities within or adjacent to their habitat. It is not anticipated that these management actions would negatively impact western yellow-billed cuckoo or its proposed critical habitat.

The management actions for salable minerals in this RMP revision/EIS provide guidance for managing permitting and project development within the planning area. Some actions may benefit the species through restrictions of roads, or other activities within or adjacent to their habitats. It is not anticipated that these management actions would negatively impact western yellow-billed cuckoo or its proposed critical habitat.

#### **Fire and Fuels Management**

The management actions in the fire and fuels program of this RMP revision/EIS provide management guidance for wildfire suppression and fuels treatment activities, while protecting other resource values. These actions do not authorize any activities, and it is not expected that any fuels treatments would be conducted within or adjacent to critical habitat areas. It is not anticipated that these management actions would impact western yellow-billed cuckoo.

### **Biological Resources**

Changes to management of forest and woodlands in this RMP revision/EIS are designed to minimize impacts to other resources. Some actions may impact the species through projects that would alter vegetation within or adjacent to their critical habitat. Because of management guidance that protects resources, including habitats used by cuckoos and other wildlife species in this and other sections, any impacts are expected to be minimal.

Changes to management of grassland and shrubland communities in this RMP revision/EIS are designed to minimize impacts to resources. Some actions may impact the species through projects that would alter vegetation within or adjacent to their critical habitat. Because of management guidance that protects resources, including habitats used by cuckoos and other wildlife species, in this and other sections, any impacts are expected to be minimal.

The invasive species and pest management actions in this RMP revision/EIS are designed provide for control of these species while minimizing impacts to other resources. Because application of chemicals and other methods to control invasive species and pests under these management actions would be a very specific, defined, site-specific process, no impacts to yellow-billed cuckoo or its proposed critical habitat from these management actions are expected.

The management actions in the general wildlife section of this RMP revision/EIS are designed to provide protections and generally guide management of wildlife habitat in the planning area. The management actions in this section are general, and more specific management actions will be discussed in the following sections. Some of the management guidance may benefit the species through actions that provide for protection of other species or their habitats, within or adjacent to western yellow-billedcuckoo habitats. It is not anticipated that these management actions would negatively impact western yellow-billed cuckoo or its proposed critical habitat.

The management actions in the big game portion of the fish and wildlife section of this RMP revision/EIS are designed to provide protections to important winter and parturition habitat for big game. Some of the management guidance may benefit the species through actions that provide for protection of other species or their habitats, within or adjacent to western yellow-billed cuckoo habitats. It is not anticipated that these management actions would negatively impact western yellow-billed cuckoo or its proposed critical habitat.

The management actions in the raptor portion of the fish and wildlife section of this revision are designed specifically to provide protections to nesting raptors. Some of the management guidance may benefit the species through actions that provide for protection of other species or their habitats, within or adjacent to western yellow-billed cuckoo habitats. It is not anticipated that these management actions would negatively impact western yellow-billed cuckoo or its proposed critical habitat.

The management actions in the fish portion of the fish and wildlife section of this RMP revision/EIS are

designed specifically to provide protections for fish species and their habitats. Some of the management guidance may benefit the species through actions that provide for protection of other species or their habitats, within or adjacent to western yellow-billed cuckoo habitat. It is not anticipated that these management actions would negatively impact western yellow-billed cuckoo or its proposed critical habitat.

The management actions in the special status plants portion of the biological resources program in this revision are designed to specifically provide protections for special status plants. Some of the management guidance may benefit the species through actions that provide for protection of other species or their habitats, within or adjacent to western yellow-billed cuckoo habitats. It is not anticipated that these management actions would negatively impact western yellow-billed cuckoo or its proposed critical habitat.

The management actions in the special status species, wildlife and fisheries portion of this RMP revision/EIS are designed to provide protections for special status wildlife and fish species. Some of the management guidance may benefit the species through actions that provide for protection of other species or their habitats, within or adjacent to western yellow-billed cuckoo habitats. It is not anticipated that these management actions would negatively impact western yellow-billed cuckoo or its proposed critical habitat.

The management actions in the wild horse portion of biological resources are designed to provide for the management of designated HMAs. None of the actions in this section authorize any activities that would impact the western yellow-billed cuckoo or its proposed critical habitat.

#### **Heritage and Visual Resources**

The management actions in the cultural section of this RMP revision/EIS are designed to provide protection for specific sites and specific resources. None of the actions in this section authorize any activities that would impact the western yellow-billed cuckoo or its proposed critical habitat.

The management actions in the paleontological section of this RMP revision/EIS are designed to provide for protection and management of paleontological resources. None of the actions in this section authorize any activities that would impact the western yellow-billed cuckoo or its proposed critical habitat.

The management actions in the visual section of this RMP revision/EIS are designed to meet the specific requirements of the VRM Classes. None of the actions in this section authorize any activities that would impact the western yellow-billed cuckoo or its proposed critical habitat.

#### **Land Resources**

The management actions in the lands and realty section of this RMP revision/EIS provide general management guidance for related actions while minimizing impacts to other resources. Although unlikely, changes in some of the lands and realty management actions included in the RMP revision/EIS may indirectly protect western yellow-billed cuckoo through land acquisitions, retentions, and reclamations. Road closures would reduce the number of people within western yellow-billed cuckoo habitat and the resulting behavioral disruption impacts on the species and its proposed critical habitat.

The management actions in the renewable energy section of this RMP revision/EIS provide guidance for the approval and management of renewable energy development within the planning area. Some of the

management guidance may benefit the species through actions that provide for protection of other species or their habitats, within or adjacent to western yellow-billed cuckoo habitats. It is not anticipated that these management actions would negatively impact western yellow-billed cuckoo or its proposed critical habitat.

The management actions in the ROW corridors section of this RMP revision/EIS provide management guidance for currently identified corridors, closure of existing corridors, and designation of new corridors. Restrictions of ROW corridors could also benefit the species by reducing ground disturbances in habitat occupied by western yellow-billed cuckoo.

The management actions for livestock grazing management in this RMP revision/EIS provide guidance for authorization and management of livestock grazing on lands within the planning area. Livestock grazing is permitted in identified western yellow-billed cuckoo habitat within the planning area and may

have some impacts through the altering or removal of vegetation. Although unlikely, changes in some of the livestock management program may indirectly protect the species through the development of a drought contingency plan which could reduce grazing pressure near western yellow-billed cuckoo habitats; the promotion of balanced grazing could also alleviate heavy grazing impacts in wetland areas. It is anticipated that any impacts would not adversely impact the western yellow-billed cuckoo or its proposed critical habitat.

The management actions in the recreation section of this RMP revision/EIS provide guidance for management of recreation activities within the planning area, while providing for protections to other resource values. The minimizing of recreation sites and access points along streams and riparian areas and closing areas to camping near streams and riparian areas may benefit the western yellow-billed cuckoo and protect the species and proposed critical habitat. It is not anticipated that there would be negative impacts to the western yellow-billed cuckoo or proposed critical habitat from these actions.

The management actions in the OHV section of this RMP revision/EIS provide guidance for managing OHV use within the planning area. The minimizing of impacts and restricting use of OHVs through identifying open and closed areas could benefit yellow-billed cuckoo and its habitats by restricting travel of OHVs in those areas. It is not anticipated that there would be negative impacts to the western yellow-billed cuckoo or its proposed critical habitat from these actions.

### **Special Designations**

The management actions in the congressionally designated trails section of this RMP revision/EIS are meant to provide guidance for both the management of the trail corridors and any activities that are proposed within those corridors. Although unlikely, at points where the trails cross habitat for the yellow-billed cuckoo, restrictions identified in these actions may indirectly benefit the cuckoo by protecting its habitat. No negative impacts from these actions are anticipated on the western yellow-billed cuckoo or its proposed critical habitat.

The management actions in the wilderness study area section of this RMP revision/EIS provide for future designations of these areas if they are not designated as wilderness, as well as designation of their current VRM Class. There is no identified habitat for the western yellow-billed cuckoo in the designated wilderness study areas in the planning area. Therefore, no impacts to the western yellow-billed cuckoo or its proposed

critical habitat are anticipated from these actions.

The management actions in the wild and scenic rivers section of this RMP revision/EIS provide guidance for the designation and management of those areas that meet the suitability factors. There is no identified habitat for the western yellow-billed cuckoo in the designated wild and scenic areas in the planning area. Therefore, no impacts to the western yellow-billed cuckoo or its proposed critical habitat are anticipated from these actions.

The management actions in the management areas section of this RMP revision/EIS provide guidance for managing both the areas and any activities that might occur in them. There is no identified habitat for the western yellow-billed cuckoo in the designated management areas in the planning area. Therefore, no impacts to the western yellow-billed cuckoo or its proposed critical habitat are anticipated from these actions.

The management actions in the ACEC section of this RMP revision/EIS provide management guidance for designating and retaining the ACEC status and provide management guidance for activities within those areas. There is no identified habitat for the western yellow-billed cuckoo in the designated ACECs in the planning area. Therefore, no impacts to the western yellow-billed cuckoo or its proposed critical habitat are anticipated from these actions.

### **Socioeconomic**

The management actions in the socioeconomic resources program provide management guidance for protection of human health and the environment from hazardous resources and wastes, and for the consideration of socioeconomic impacts during project planning. These actions do not authorize any surface disturbing or disruptive activities and will have no impacts on the western yellow-billed cuckoo or their proposed critical habitat within the planning area.

### **Cumulative Effects**

Cumulative impacts, according to the ESA, Section 7 Consultation Handbook definition (USFWS 1998a) include the incremental impacts of future state or private activities (i.e., excluding federal activities) that are reasonably certain to occur within the action area of the federal action subject to consultation.

Existing and proposed activities on non-federal lands in the planning area that have the potential to cumulatively affect the species include but are not limited to the following:

- Non-federal oil and gas and related energy development
- Water depletions from irrigation diversions and dams
- Livestock grazing on private lands
- Subdivision development along rivers
- Recreation along rivers and river corridors (including camping, rafting, and hunting)
- Transmission lines.

Implementation of the RMP revision/EIS would not change any potential effects to western yellow-billed cuckoo or its proposed critical habitat that may result from current or projected future non-federal actions.

### **Effects Determination**

The effects determination addresses the Preferred Alternative for the Rock Springs Field Office RMP

Revision/EIS. The RMP itself does not authorize any specific actions that would cause surface disturbance or disruption. Any proposed projects that may have an impact on threatened or endangered species would have consultation completed at that time. Other than the actions/programs discussed below, the actions in the RMP revision/EIS have been determined to have “No Effect” on the western yellow-billed cuckoo and its proposed critical habitat.

Management actions in the following sections provided management guidance that may inadvertently provide protections to western-yellow-billed cuckoo and its proposed critical habitat through restricting development, roads, timing restrictions on industry and public access, or removal of vegetation within or adjacent to the cuckoo’s identified habitat. These sections include leasable minerals, salable minerals, forest and fuels, grass and shrublands, general wildlife, big game, raptors, fish, special status species, lands and realty, ROW corridors, comprehensive travel and transportation management, livestock grazing, recreation, and off-highway vehicles. No negative impacts from these actions are expected, so it has been determined that the mineral resources, biological resources, land resources and special designation programs are “Likely to Affect, Not Likely to Adversely Affect” the western yellow-billed cuckoo and its proposed critical habitat.

## **H.4.7 Monarch Butterfly (*Danaus plexippus*)**

### **Effects of Selected Alternative**

#### **Physical Resources**

Management actions in the RMP revision/EIS Preferred Alternative for air quality include those related to monitoring and analyses, as well as dust abatement, and would have no impacts to the Monarch butterfly or its habitat.

The management actions for soil and geologic resources in this RMP revision/EIS provide management guidance for protecting and monitoring erosion, sedimentation and other areas related to soil and geologic resources. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions for the water resources section of this RMP revision/EIS provide management guidance for the protection and improvement of water resources within the planning area. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

Management actions in the RMP/EIS Preferred Alternative for lands with wilderness characteristics deal with acquisition and/or general management of the identified areas. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

#### **Mineral Resources**

Management actions in the RMP/EIS Preferred Alternative for locatable minerals identify open areas, and areas that withdrawal from locatable minerals will be pursued. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions for leasable minerals in this RMP revision/EIS provide guidance for managing leasing and project development within the planning area. These actions do not authorize any surface disturbing or disruptive activities. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

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The management actions for salable minerals in this RMP revision/EIS provide guidance for managing permitting and project development within the planning area. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

### **Fire and Fuels Management**

The management actions in the fire and fuels program of this RMP revision provide management guidance for wildfire suppression and fuels treatment activities, while protecting other resource values. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

### **Biological Resources**

Changes to management of forest and woodlands in this RMP revision/EIS are designed to minimize impacts to other resources. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

Changes to management of grassland and shrubland communities in this RMP revision/EIS are designed to minimize impacts to resources. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The invasive species and pest management actions in this RMP revision/EIS are designed provide for control of these species while minimizing impacts to other resources. Application of chemicals and other methods to control invasive species and pests under these management actions would be a very specific, defined, site-specific process. Use of pesticides to control invasive weeds may inadvertently impact milkweed, which could cause impacts to the Monarch butterfly and its habitat.

The management actions in the general wildlife section of this RMP revision/EIS are designed to provide protections and generally guide management of wildlife habitat in the planning area. The management actions in this section are general, and more specific management actions will be discussed in the following sections. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions in the big game portion of the fish and wildlife section of this RMP revision/EIS are designed to provide protections to important winter and parturition habitat for big game. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions in the raptor portion of the fish and wildlife section of this revision are designed specifically to provide protections to nesting raptors. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions in the fish portion of the fish and wildlife section of this revision are designed specifically to provide protections for fish species and their habitats. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions in the special status plants portion of the biological resources program in this RMP revision/EIS are designed to specifically provide protections for special status plants. It is not anticipated that these management actions would the Monarch butterfly or its habitats.



The management actions in the special status species, wildlife and fisheries portion of this RMP revision/EIS are designed to provide protections for special status wildlife and fish species. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions in the wild horse portion of biological resources are designed to provide for the management of designated HMAs. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

### **Heritage and Visual Resources**

The management actions in the cultural section of this RMP revision/EIS are designed to provide protection for specific sites and specific resources. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions in the paleontological section of this RMP revision/EIS are designed to provide for protection and management of paleontological resources. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions in the visual section of this RMP revision/EIS are designed to meet the specific requirements of the VRM Classes. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

### **Land Resources**

The management actions in the lands and realty section of this RMP revision/EIS provide general management guidance for related actions while minimizing impacts to other resources. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions in the renewable energy section of this RMP revision/EIS provide guidance for the approval and management of renewable energy development within the planning area. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions in the ROW corridors section of this RMP revision/EIS provide management guidance for currently identified corridors, closure of existing corridors, and designation of new corridors. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions for livestock grazing management in this RMP revision/EIS provide guidance for authorization and management of livestock grazing on lands within the planning area. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions in the recreation section of this RMP revision/EIS provide guidance for management of recreation activities within the planning area, while providing protections for other resource values. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions in the OHV section of this RMP revision/EIS provide guidance for managing OHV use within the planning area. No impacts to Monarch butterfly or its habitat are anticipated from these actions.

### **Special Designations**

The management actions in the congressionally designated trails section of this RMP revision/EIS are meant to provide guidance for both the management of the trail corridors and any activities that are proposed within those corridors. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions in the wilderness study area section of this RMP revision/EIS provide for future designations of these areas if they are not designated as wilderness, as well as designation of their current VRM Class. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions in the wild and scenic rivers section of this RMP revision/EIS provide guidance for the designation and management of those areas that meet the suitability factors. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions in the management areas section of this RMP revision/EIS provide guidance for managing both the areas and any activities that might occur in them. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

The management actions in the ACEC section of this RMP revision/EIS provide management guidance for designating and retaining the ACEC status and provide management guidance for activities within those areas. No impacts to the Monarch butterfly and its habitat are anticipated.

### **Socioeconomic**

The management actions in the socioeconomic resources program provide management guidance for protection of human health and the environment from hazardous resources and wastes, and for the consideration of socioeconomic impacts during project planning. No impacts to the Monarch butterfly or its habitat are anticipated from these actions.

### **Cumulative Effects**

Cumulative impacts, according to the ESA, Section 7 Consultation Handbook definition (USFWS 1998a) include the incremental impacts of future state or private activities (i.e., excluding federal activities) that are reasonably certain to occur within the action area of the federal action subject to consultation.

Existing and proposed activities on non-federal lands in the planning area that have the potential to cumulatively affect the species include but are not limited to the following:

- Non-federal oil and gas and related energy development
- Water depletions from irrigation diversions and dams
- Livestock grazing on private lands
- Subdivision development along rivers
- Recreation along rivers and river corridors (including camping, rafting, and hunting)
- Transmission lines.

Implementation of the RMP revision/EIS would not change any potential effects to the Fremont County rockcress or its habitat that may result from current or projected future non-federal actions.

## Effects Determination

The effects determination addresses the Preferred Alternative for the Rock Springs Field Office RMP Revision/EIS. The RMP itself does not authorize any specific actions that would cause surface disturbance or disruption. Because the Monarch butterfly is a candidate species, nodeterminations of effects have been made. However, no negative impacts to the Monarch butterfly are anticipated from the actions in this RMP revision/EIS.

### H.4.8 Ute Ladies'-Tresses (*Spiranthes diluvialis*)—Threatened

#### Effects of Selected Alternative

##### Physical Resources

The physical resources program includes management actions for air quality, soil, geologic, water, and lands with wilderness characteristics.

Management actions in the RMP revision/EIS Preferred Alternative for air quality include those related to monitoring and analyses, as well as dust abatement and would have no impacts to the Ute ladies'-tresses or its habitat.

The management actions for soil and geologic resources in this RMP revision/EIS provide management guidance for protecting and monitoring erosion, sedimentation and other areas related to soil and geologic resources. Actions that are designed to minimized erosion and sedimentation would reduce impacts to streams, riparian areas and wetlands. These would have positive impacts to Ute ladies'-tresses by protecting the species and their habitat. No negative impacts to Ute ladies'-tresses from these actions are anticipated.

The management actions for the water resources section of this RMP revision/EIS provide management guidance for the protection and improvement of water resources within the planning area. Actions that are designed to protect water resources would also be expected to provide protections for the Ute ladies'-tresses through actions that would minimize erosion and sedimentation and protection of streams, riparian areas, and wetlands. It is anticipated that these actions would have positive impacts to Ute ladies'-tresses by protecting the species and their habitat. No negative impacts to Ute ladies'-tresses from these actions are anticipated.

Management actions in the RMP/EIS Preferred Alternative for lands with wilderness characteristics deal with acquisition and/or general management of the identified areas, none of which contain habitat, and because actions in other sections of this revision, such as special status plant species, provide restrictions on development and disturbance that would provide protections to the plants, no impacts to Ute ladies'-tresses or its habitat are anticipated from these actions.

##### Mineral Resources

Management actions in the RMP Preferred Alternative for locatable minerals identify open areas and areas where withdrawal from locatable minerals will be pursued. No negative impacts to Ute ladies'-tresses from these actions are anticipated, because actions in other sections of this revision, such as special status plant species, provide restrictions on development and disturbance that would provide protections to the plants.

The management actions for leasable minerals in this RMP revision/EIS provide guidance for managing leasing and project development within the planning area. Actions that allow for leasing and subsequent surface disturbance during project development, may have an impact on Ute ladies'-tresses; however, because actions in this and in other sections of this revision, such as special status plant species, provide restrictions on development and disturbance that would provide protections to the plants, impacts to Ute ladies'-tresses or its habitat are expected to be minimal.

The management actions for salable minerals in this RMP revision/EIS provide guidance for managing permitting and project development within the planning area. Actions that allow for leasing and subsequent surface disturbance during project development, may have an impact on the Ute ladies' - tresses; however, because actions in this and in other sections of this revision, such as special status plant species, provide restrictions on development and disturbance that would provide protections to the plants, impacts to Ute ladies'-tresses or its habitats are expected to be minimal.

### **Fire and Fuels Management**

The management actions in the fire and fuels program of this RMP revision/EIS provide management guidance for wildfire suppression and fuels treatment activities, while protecting other resource values. These actions do not authorize any activities. Actions that allow fuels treatment project to be conducted may have an impact on the Ute ladies'-tresses; however, because actions in this and in other sections of this revision, such as special status plant species, provide restrictions on development and disturbance that would provide protections to the plants, impacts to Ute ladies'-tresses or its habitat are expected to be minimal.

### **Biological Resources**

Changes to management of forest and woodlands in this RMP revision/EIS are designed to minimize impacts to other resources. Actions that allow vegetation removal or enhancement may have an impact on the Ute ladies'-tresses; however, because actions in this and in other sections of this revision, such as special status plant species, provide restrictions on disturbance that would provide protections to the plants, impacts to Ute ladies'-tresses or its habitat are expected to be minimal.

Changes to management of grassland and shrubland communities in this RMP revision/EIS are designed to minimize impacts to resources. Actions that allow vegetation removal or enhancement may have an impact on the Ute ladies'-tresses; however, because actions in this and in other sections of this revision, such as special status plant species, provide restrictions on disturbance that would provide protections to the plants, impacts to Ute ladies'-tresses or its habitat are expected to be minimal.

The invasive species and pest management actions in this RMP revision/EIS are designed provide for control of these species while minimizing impacts to other resources. Because application of chemicals and other methods to control invasive species and pests under these management actions would be a very specific, defined, site-specific process; no impacts to Ute ladies'-tresses or their habitat from the management actions are expected.

The management actions in the general wildlife section of this RMP revision/EIS are designed to provide protections and generally guide management of wildlife habitat in the planning area. The management actions in this section are general, and more specific management actions will be discussed in the following sections. Some of the management guidance may benefit the species through actions that provide for protection of other species or their habitats. It is not anticipated that these management actions would negatively impact Ute ladies'-tresses or their habitat.

The management actions in the big game portion of the fish and wildlife section of this RMP revision/EIS are designed to provide protections to important winter and parturition habitat for big game. Some of the management guidance may benefit the species through actions that provide for protection of other species or their habitats. It is not anticipated that these management actions would negatively impact Ute ladies'-tresses or their habitat.

The management actions in the raptor portion of the fish and wildlife section of this revision are designed specifically to provide protections to nesting raptors. Some of the management guidance may benefit the species through actions that provide for protection of other species or their habitats. It is not anticipated that these management actions would negatively impact Ute ladies'-tresses or their habitat.

The management actions in the fish portion of the fish and wildlife section of this RMP revision/EIS are designed specifically to provide protections for fish species and their habitats. Some of the management guidance may benefit the species through actions that provide for protection of other species or their habitats. It is not anticipated that these management actions would negatively impact Ute ladies'-tresses or their habitat.

The management actions in the special status plants portion of the biological resources program in this revision are designed to specifically provide protections for special status plants. These actions are specifically designed to provide management guidance for the protection of plants like the Ute ladies'-tresses. Some of the other management guidance may benefit the species through actions that provide for protection of other species or their habitats. It is not anticipated that these management actions would negatively impact Ute ladies'-tresses or their habitats.

The management actions in the special status species, wildlife and fisheries portion of this RMP revision/EIS are designed to provide protections for special status wildlife and fish species. Some of the management guidance may benefit the species through actions that provide for protection of other species or their habitats. It is not anticipated that these management actions would negatively impact Ute ladies'-tresses or their habitat.

The management actions in the wild horse portion of biological resources are designed to provide for the management of designated HMAs. Some of the management guidance may benefit the species through actions that reduce or redistribute wild horse herds. It is not anticipated that these management actions would negatively impact Ute ladies'-tresses or their habitat.

### **Heritage and Visual Resources**

The management actions in the cultural section of this RMP revision/EIS are designed to provide protection for specific sites and specific resources. None of the actions in this section authorize any activities that would impact the Ute ladies'-tresses or their habitat.

The management actions in the paleontological section of this RMP revision/EIS are designed to provide for protection and management of paleontological resources. None of the actions in this section authorize any activities that would impact the Ute ladies'-tresses or their habitat.

The management actions in the visual section of this RMP revision/EIS are designed to meet the specific requirements of the VRM Classes. None of the actions in this section authorize any activities that would impact the Ute ladies'-tresses or their habitat.

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## Land Resources

The management actions in the lands and realty section of this RMP revision/EIS provide general management guidance for related actions while minimizing impacts to other resources. Although unlikely, changes in some of the lands and realty management actions included in the RMP revision/EIS may indirectly protect Ute ladies'-tresses through land acquisitions, retentions, and reclamations. It is not anticipated that these management actions would negatively impact Ute ladies'-tresses or their habitat.

The management actions in the renewable energy section of this RMP revision/EIS provide guidance for the approval and management of renewable energy development within the planning area. Although there may be some impacts from management guidance that opens areas to renewable energy development, and subsequent development activities, actions that provide restrictions on the types and location of disturbance, both in this section as well as in other sections, such as the special status plant species section of this RMP revision/EIS, would be expected to minimize any negative impacts to the Ute ladies'-tresses and their habitat.

The management actions in the ROW corridors section of this RMP revision/EIS provide management guidance for currently identified corridors, closure of existing corridors, and designation of new corridors. Although there may be some impacts from management guidance that opens areas to ROW development, and subsequent development activities, actions that provide restrictions on the types and location of disturbance, both in this section as well as in other sections such as the special status plant species section of this RMP revision/EIS, would be expected to minimize any negative impacts to the Ute ladies'-tresses and their habitat.

The management actions for livestock grazing management in this RMP revision/EIS provide guidance for authorization and management of livestock grazing on lands within the planning area. Livestock grazing is permitted in Ute ladies'-tresses habitat within the planning area and may have some impacts through the altering or removal of vegetation. Although unlikely, changes in the livestock management program may indirectly protect the species through the development of a drought contingency plan which could reduce grazing pressure near Ute ladies'-tresses habitats; the promotion of balanced grazing could also alleviate heavy grazing impact in wetland and riparian areas. It is anticipated that any impacts would not adversely impact the Ute ladies'-tresses or its habitat.

The management actions in the recreation section of this RMP revision/EIS provide guidance for management of recreation activities within the planning area, while providing for protections to other resource values. Minimizing recreation sites and access points along streams and riparian areas and closing areas near streams and riparian areas to camping may benefit the Ute ladies'-tresses and protect the species and its habitat. It is not anticipated that there would be negative impacts to the Ute ladies'-tresses or their habitat from these actions.

The management actions in the OHV section of this RMP revision/EIS provide guidance for managing OHV use within the planning area. Although there may be some impacts from management guidance that opens areas to OHV use, actions that provide restrictions on the types and location of disturbance, both in this section as well as in other sections such as the special status plant species section of this RMP revision/EIS, would be expected to minimize any negative impacts to the Ute ladies'-tresses and their habitat.

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## Special Designations

The management actions in the congressionally designated trails section of this RMP revision/EIS are meant to provide guidance for both the management of the trail corridors and any activities that are proposed within those corridors. The minimizing of disturbance within the trail corridors may benefit the Ute ladies'-tresses and protect the species and its habitat. It is not anticipated that there would be negative impacts to the Ute ladies'-tresses or their habitat from these actions.

The management actions in the wilderness study area section of this RMP revision/EIS provide for future designations of these areas if they are not designated as wilderness, as well as designation of their current VRM Class. These actions provide protections and restrictions that would be put in place if the wilderness study designation was removed. It is not anticipated that there would be negative impacts to the Ute ladies'-tresses or their habitat from these actions.

The management actions in the wild and scenic rivers section of this RMP revision/EIS provide guidance for the designation and management of those areas that meet the suitability factors. The minimizing/prohibition of disturbance along streams and riparian areas within these designations may benefit the Ute ladies'-tresses and protect it and its habitat. It is not anticipated that there would be negative impacts to the Ute ladies'-tresses or their habitat from these actions.

The management actions in the management areas section of this RMP revision/EIS provide guidance for managing both the areas and any activities that might occur in them. The minimizing, restriction and prohibition of disturbance and other activities in these management areas may benefit the Ute ladies'-tresses and protect the species and its habitat. It is anticipated that there would be minimal negative impacts to the Ute ladies'-tresses or their habitat from these actions.

The management actions in the ACEC section of this RMP revision/EIS provide management guidance for designating and retaining the ACEC status and provide management guidance for activities within those areas. The minimizing, restriction, and prohibition of disturbance within the ACECs may benefit the Ute ladies'-tresses and protect the species and its habitat. It is not anticipated that there would be negative impacts to the Ute ladies'-tresses or their habitat from these actions.

## Socioeconomic

The management actions in the socioeconomic resources program provide management guidance for protection of human health and the environment from hazardous resources and wastes, and for the consideration of socioeconomic impacts during project planning. These actions do not authorize any surface disturbing or disruptive activities and will have no impacts on the Ute ladies'-tresses or its habitat within the planning area.

## Cumulative Effects

Cumulative impacts, according to the ESA, Section 7 Consultation Handbook definition (USFWS 1998a) include the incremental impacts of future state or private activities (i.e., excluding federal activities) that are reasonably certain to occur within the action area of the federal action subject to consultation.

Existing and proposed activities on non-federal lands in the planning area that have the potential to cumulatively affect the species include but are not limited to the following:

- Non-federal oil and gas and related energy development
- Water depletions from irrigation diversions and dams
- Livestock grazing on private lands
- Sand and gravel operations along major river corridors
- Existing and proposed wind farms
- Hard rock mining (including coal, trona, and phosphates)
- Bentonite mining
- Subdivision development along rivers
- Recreation along rivers and river corridors (including camping, rafting, hunting, and golf course development)
- Coal mine operations
- Transmission lines
- Seismic exploration
- Trona (soda ash) mining
- Municipal dump expansions.

Implementation of the RMP revision would not change any potential effects to the Ute ladies'-tresses that may result from current or projected future non-federal actions.

### **Effects Determination**

The effects determination addresses the Preferred Alternative for the Rock Springs Field Office RMP Revision/EIS. The RMP itself does not authorize any specific actions that would cause surface disturbance or disruption. Any proposed projects that may have an impact on threatened or endangered species would have consultation completed at that time. Other than the actions/programs discussed below, the actions in the RMP revision/EIS have been determined to have "No Effect" on the Ute ladies'-tresses or its habitat.

Management actions in the following sections provided management guidance that may inadvertently provide protections to Ute ladies'-tresses or its habitat through restricting development, roads, or removal of vegetation within or adjacent to the Ute ladies'-tresses identified habitat. These sections include soil and geologic, water, locatable minerals, leasable minerals, salable minerals, fire and fuels, forest and woodlands, grass and shrublands, general wildlife, big game, raptors, fish, special status species, lands and realty, ROW corridors, comprehensive travel and transportation management, livestock grazing, recreation, and OHV, congressionally designated trails, wilderness study areas, wild and scenic rivers, management areas, and ACECs. Some negative impacts within the locatable minerals, leasable minerals, lands and realty, renewable energy and livestock grazing; however, actions designed specifically to guide, restrict, minimize and mitigate for activities that would cause surface disturbance would minimize any impacts to the Ute ladies'-tresses. Based on the restrictions and protections provided in the management actions in this document, it has been determined that the physical resources, mineral resources, biological resources, land resources, and special designation programs are "Likely to Affect, Not Likely to Adversely Affect" the Ute ladies'-tresses or its habitat.

## **H.4.9 Whitebark Pine**

### **Physical Resources**

Management actions in the RMP revision/EIS Preferred Alternative for air quality include those related to monitoring and analyses, as well as dust abatement and would have no impacts to the whitebark pine or its habitat.



The management actions for soil and geologic resources in this RMP revision/EIS provide management guidance for protecting and monitoring erosion, sedimentation and other areas related to soil and geologic resources. Actions that are designed to minimize erosion and sedimentation would reduce impacts to streams, riparian areas and wetlands. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions for the water resources section of this RMP revision/EIS provide management guidance for the protection and improvement of water resources within the planning area. No impacts to whitebark pine or its habitat from these actions are anticipated.

Management actions in the RMP/EIS Preferred Alternative for lands with wilderness characteristics deal with acquisition and/or general management of the identified areas with wilderness characteristics. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

### **Mineral Resources**

Management actions in the RMP Preferred Alternative for locatable minerals identify open areas and areas where withdrawal from locatable minerals will be pursued. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions for leasable minerals in this RMP revision/EIS provide guidance for managing leasing and project development within the planning area. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions for salable minerals in this RMP revision/EIS provide guidance for managing permitting and project development within the planning area. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

### **Fire and Fuels Management**

The management actions in the fire and fuels program of this RMP revision/EIS provide management guidance for wildfire suppression and fuels treatment activities, while protecting other resource values. These actions do not authorize any activities. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

### **Biological Resources**

Changes to management of forest and woodlands in this RMP revision/EIS are designed to minimize impacts to other resources. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

Changes to management of grassland and shrubland communities in this RMP revision/EIS are designed to minimize impacts to resources. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The invasive species and pest management actions in this RMP revision/EIS are designed to provide for control of these species while minimizing impacts to other resources. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions in the general wildlife section of this RMP revision/EIS are designed to provide protections and generally guide management of wildlife habitat in the planning area. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these

actions are anticipated.

The management actions in the big game portion of the fish and wildlife section of this RMP revision/EIS are designed to provide protections to important winter and parturition habitat for big game. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions in the raptor portion of the fish and wildlife section of this revision are designed specifically to provide protections to nesting raptors. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions in the fish portion of the fish and wildlife section of this RMP revision/EIS are designed specifically to provide protections for fish species and their habitats. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions in the special status plants portion of the biological resources program in this revision are designed to specifically provide protections for special status plants. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions in the special status species, wildlife and fisheries portion of this RMP revision/EIS are designed to provide protections for special status wildlife and fish species. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions in the wild horse portion of biological resources are designed to provide for the management of designated HMAs. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

### **Heritage and Visual Resources**

The management actions in the cultural section of this RMP revision/EIS are designed to provide protection for specific sites and specific resources. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions in the paleontological section of this RMP revision/EIS are designed to provide for protection and management of paleontological resources. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions in the visual section of this RMP revision/EIS are designed to meet the specific requirements of the VRM Classes. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

### **Land Resources**

The management actions in the lands and realty section of this RMP revision/EIS provide general management guidance for related actions while minimizing impacts to other resources. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions in the renewable energy section of this RMP revision/EIS provide guidance for the approval and management of renewable energy development within the planning area. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions in the ROW corridors section of this RMP revision/EIS provide management guidance for currently identified corridors, closure of existing corridors, and designation of new corridors. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions for livestock grazing management in this RMP revision/EIS provide guidance for authorization and management of livestock grazing on lands within the planning area. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions in the recreation section of this RMP revision/EIS provide guidance for management of recreation activities within the planning area, while providing for protections to other resource values. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions in the OHV section of this RMP revision/EIS provide guidance for managing OHV use within the planning area. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

### **Special Designations**

The management actions in the congressionally designated trails section of this RMP revision/EIS are meant to provide guidance for both the management of the trail corridors and any activities that are proposed within those corridors. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions in the wilderness study area section of this RMP revision/EIS provide for future designations of these areas if they are not designated as wilderness, as well as designation of their current VRM Class. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions in the wild and scenic rivers section of this RMP revision/EIS provide guidance for the designation and management of those areas that meet the suitability factors. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions in the management areas section of this RMP revision/EIS provide guidance for managing both the areas and any activities that might occur in them. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

The management actions in the ACEC section of this RMP revision/EIS provide management guidance for designating and retaining the ACEC status and provide management guidance for activities within those areas. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

### **Socioeconomic**

The management actions in the socioeconomic resources program provide management guidance for protection of human health and the environment from hazardous resources and wastes, and for the consideration of socioeconomic impacts during project planning. No known populations of whitebark pine exist within the planning area and no impacts to whitebark pine or its habitat from these actions are anticipated.

### **Cumulative Effects**

Cumulative impacts, according to the ESA, Section 7 Consultation Handbook definition (USFWS 1998a) include the incremental impacts of future state or private activities (i.e., excluding federal activities) that are reasonably certain to occur within the action area of the federal action subject to consultation.

Existing and proposed activities on non-federal lands in the planning area that have the potential to cumulatively affect the species include but are not limited to the following:

- Non-federal oil and gas and related energy development
- Water depletions from irrigation diversions and dams
- Livestock grazing on private lands
- Sand and gravel operations along major river corridors
- Existing and proposed wind farms
- Hard rock mining (including coal, trona, and phosphates)
- Bentonite mining
- Subdivision development along rivers
- Recreation along rivers and river corridors (including camping, rafting, hunting, and golf course development)
- Coal mine operations
- Transmission lines
- Seismic exploration
- Trona (soda ash) mining
- Municipal dump expansions.

Implementation of the RMP revision would not change any potential effects to the whitebark pine that may result from current or projected future non-federal actions.

### **Effects Determination**

The effects determination addresses the Preferred Alternative for the Rock Springs Field Office RMP Revision/EIS. The RMP itself does not authorize any specific actions that would cause surface disturbance or disruption. Any proposed projects that may have an impact on threatened or endangered species would have consultation completed at that time. The actions in the RMP revision/EIS have been determined to have “No Effect” on the whitebark or its habitat.

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# APPENDIX I—RECLAMATION PLAN

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## I.1 INTRODUCTION

Reclamation of public land is required for any surface disturbing activity. A reclamation plan tailored to a specific surface disturbing activity will be required for Federal actions authorized, conducted, or funded by the Bureau of Land Management (BLM) that causes surface disturbance. This appendix details the elements that need to be considered during project planning, project implementation, and post-disturbance steps required to assure timely and proper recovery of the site.

This plan provides a framework for project-specific and site-specific reclamation actions that guide land management toward a future condition for any surface disturbance. Early coordination between the BLM and project proponents is necessary to produce a comprehensive, site specific plan. The site-specific reclamation plan will serve as a binding agreement between project proponents and the land management agencies for the expected reclamation condition of the disturbed lands and may be periodically reviewed and modified as necessary. The reclamation plan will include sufficient monitoring requirements, reports, and components to ensure sufficiency.

Although the proponent will typically develop the reclamation plan, appropriate BLM involvement in preplanning, data inventory, and approval is essential to develop the optimum reclamation proposal. Most determinations regarding what is expected should be made before the reclamation plan is approved and implemented. However, the BLM Authorizing Officer (AO) can modify a plan through adaptive management, to adjust to changing conditions or to correct for an oversight using the best available science; changes should be agreed upon by the project proponent. Approved reclamation and weed control plans and reporting obligations will be required prior to any surface disturbing activity.

## I.2 ECOLOGICAL SITE DESCRIPTION

To understand the variations across the landscape, Natural Resource Conservation Service (NRCS) has classified these different parts into units called ecological sites. Ecological site is defined as “a distinctive kind of land with specific characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation.” Any land inventory, analysis, and resulting management decisions require the knowledge of these individual sites and their interrelationships to one another on the landscape.

The Ecological Site Description (ESD) application provides the capability to produce automated ESD from the data stored in its database. An ESD is the official repository for all data associated with the development of forestland and rangeland ESD by the NRCS.

The data comprising an ESD is presented in four major categories:

- Site Characteristics – Identifies the site and describes the physiographic, climate, soil, and water features associated with the site.
- Plant Communities – Describes the ecological dynamics and the common plant communities comprising the various vegetation states of the site. The disturbances that cause a shift from one state to another are also described.
- Site Interpretations – Interpretive information pertinent to the use and management of the site and its related resources.
- Supporting Information – Provides information on sources of information and data utilized in



developing the site description and the relationship of the site to other ecological sites.

This information and the ESDs the NRCS have developed to date may be found at the following website: <http://esis.sc.egov.usda.gov/Welcome/pgECOLOGICALSITEDESCRIPTIONWelcome.aspx>

### **I.2.1 Reclamation Plan Requirements/Minimum Standards**

Reclamation plans should incorporate the standards set forth in Wyoming BLM Reclamation Policy as described in IM WY-2012-032 and the High Desert District Policy for Reclamation of Disturbed Lands in IM WYD-2012-0005.

### **I.2.2 Reclamation Goals**

#### **Goals:**

- Short term goal: immediately stabilize disturbed areas and provide conditions necessary to achieve the long-term goal.
- Long term goal: facilitate eventual ecosystem reconstruction to maintain a safe and stable landscape and meet the desired outcomes of the land use plan.
- Reclaim vegetative communities within disturbed areas that will mirror those of healthy communities as described in the ESD.

### **I.2.3 Reclamation Objectives:**

- Restore vegetative cover and landforms sufficient to maintain healthy, biologically active topsoil; control erosion; and, minimize habitat loss during the life of the well, facilities, or other surface disturbing activities.

In addition:

- Provide conditions and use methods to allow for successful reclamation in the least amount of time relative to site condition.
- Return the land to the desired condition based on ESDs. This includes restoration of the landform and natural vegetative community, hydrologic systems, visual resources, and wildlife habitats. To ensure that the long-term objective will be reached through human and natural processes, actions will be taken to ensure standards are met for site stability, visual quality, hydrological function, vegetative productivity, and habitat function.

### **I.2.4 Pre-Disturbance Baseline**

Pre-disturbance inventory is a critical part of reclamation planning and provides information on ecological structure and function. This should include inventory of wildlife habitat, species composition, watershed protection, and visual qualities; as well as, characteristics that underlie those values and functions – the plants, soil, and landscape features that may require restoration. The inventory establishes a framework for successful reclamation, monitoring, and evaluation (Norton et al. 2010).

The inventory includes two steps necessary to compile complete and accurate information:

1. Gathering existing site-specific information from reliable sources
2. Evaluating on-site ecosystem function and characteristics that may require subsequent restoration (Norton et al. 2010).

**Table I-1. Description of Baseline Inventory**

<b>Activity</b>	<b>Critical Components</b>
Initiating baseline inventory	<ul style="list-style-type: none"> <li>• Identify site location</li> <li>• Contact BLM</li> <li>• Consult soil survey maps</li> <li>• Determine ESD</li> <li>• Consult Wyoming Geographic Information Center (WyGIS) to access aerial photography in color, grayscale, or color infrared (CIR)</li> <li>• Identify wildlife presence or use</li> </ul>
Conducting baseline inventory	<ul style="list-style-type: none"> <li>• Travel to site</li> <li>• Verify ESD and soil types</li> <li>• Record vegetation types and distribution on the site using an accepted method for collecting the data</li> </ul>
<b>Activity</b>	<b>Critical Components</b>
	<ul style="list-style-type: none"> <li>• Record topographical landforms and surface hydrological features</li> <li>• Take photographs to provide a visual reference</li> <li>• Document data gathering and photos with GPS coordinates.</li> </ul>

Norton et al. 2010

## **I.2.5 General Reclamation Best Management Practices**

This section identifies best management practices (BMP) that could be suggested as recommendations during interim and final reclamation. These would be BMPs for species other than GSG.

“Live-hauling” topsoil from one location to another location may aid in reclamation success, but should only be considered on a “case-by-case basis” because the ESD for topsoil from one location could be different from its destination. Timing problems could also occur when stripping topsoil from one location and hauling to another location. The quantity of topsoil could likely vary from one location to another location.

The BLM AO may direct the use of containerized plants in not more than gallon-sized pots and germinated from a local seed source. These plants would be planted in clusters to catch snow, retain moisture, and provide a seed source. This would mostly apply to native shrubs such as sagebrush and saltbush with the purpose of quickly establishing the shrub component. Some or all the following practices may be implemented to expedite reclamation:

- Planting bare-root seedlings (shrubs such as sagebrush)
- Importing topsoil to add to spots where it is absent or not productive
- Erecting fences (wildlife friendly) around reclaimed areas to allow for enhanced establishment of vegetation
- Using snow fences or an alternate snow-capture device to capture moisture
- Irrigating reclamation (enough to simulate typical spring and summer moisture) to establish roots
- Irrigating reclamation could be repeated for the first two years but not more than three. A pause in irrigation after three years provides a period for the vegetation to demonstrate persistence before

the reclamation can be accepted as complete.

## **Vegetation Management**

- Reduce vegetation damage during reclamation in adjacent areas.
- Choose native seed mixes that will provide vegetative cover for land use. Where native seed mixes of local genotype are not available, consider the use of appropriate cultivars of native species.
- Plan time of year for seed planting based on the optimal growing conditions for that species, site specific conditions, and the environmental conditions of that growing season.
- BLM approved non-native species used solely for site stabilization should be sterile, or a species unlikely to persist as natives are established.

## **Additional Monitoring Components**

Project proponent should start post-disturbance collection of cover and composition data in the first growing season after disturbance. Data must be collected using repeatable methods approved by the appropriate land management agency and will be the same methods that were used to describe vegetation for baseline (or reference area). The same methods will be used each time the vegetation is monitored.

## **Pre-Development Habitat Management**

Use native site seed collection and local seed sources to the maximum extent practicable to maintain genetic diversity of local plant populations. Consider the use of cultivars of native species in the absence of sources of native seeds.

## **Exceptions**

To facilitate reclamation seeding during the optimal growing seasons, exceptions may be approved providing that the exception granted would minimize surface disturbance outside of the action area.

## **Proponent Agreements**

The land management agencies will encourage cooperative agreements between the agencies, proponent project proponents, and interested proponents to ensure the success of habitat reclamation.

## **Criteria for Determining Reclamation Success**

The end result of reclamation success is the return of functional wildlife habitat within the disturbance area.

A. The Rangeland Ecological Site Interagency Manual (WO IB 2011-004) has the following objectives that address the use of ESD which include State and Transition Models:

- To implement a standardized system to define and describe a common unit for inventory, monitoring, evaluation, and management of rangeland ecosystems.
- To provide direction for the cooperative development and application of rangeland ESD.

B. The Rangeland Ecological Site Interagency Handbook (mentioned above) goes into detail on use of State and Transition Models and ESD and can be used as a reference when developing reclamation plans using these methods.

C. The current BLM Handbook H-4180-1 contains references to ecological sites, ESD, and reference areas. The site potential is related to transitions and thresholds in the handbook. The handbook also recognizes

the Ecological Site Index and ESD may not be available for all assessment areas, but that where they exist, they should be used. Other vegetation succession models are not mentioned in H-4180-1.

D. The National Range Handbook (H-4410-1) addresses State and Transition Models and ESD and can be used as a reference.

E. The NCRS Ecological Site Inventory Technical Reference (TR 1734-07) also discusses about succession and State and Transition Model pathways, and ESD.

F. The NCRS Riparian-Wetland Ecological Site Inventory Technical Reference (TR-1737-7) does the same as TR 1734-07 which also discusses about succession and State and Transition Model pathways, and ESD.

If ESDs, which include State and Transition Models, are not written for the project site, the project proponent should work with the land management agencies, WGFD, NCRS, and other local experts to create these products.

## General Reclamation Requirements

Vegetation would be reestablished on a site-specific basis that would meet BLM approval.

### Vegetative Criteria

**Native Forbs:** The average frequency of desirable forbs must be a minimum of 75% of the ESD reference site. Reference sites must be selected in areas of the same ESD and must be mutually agreed upon with the land management agency and WGFD. If this is not possible, the desired plant community for the site may be used. Diversity of forbs on a reclaimed site must be equal to or greater than pre-disturbance composition. Timeframes to determine whether replanting or developing another strategy to meet native forb establishment will be determined upon establishing the ESD.

**Native Shrubs:** The average frequency of the shrub component must be at least 50% of the ESD reference site. This includes both shrubs and sub-shrubs (e.g., winterfat (*Krascheninnikovia lanata*), fringed sage (*Artemisia frigida*), etc.). At least 15% density or frequency of the shrub component must be by the dominant species relative to pre-disturbance composition. The diversity of shrubs must be equal to or greater than the desired plant community. Timeframes to determine whether replanting or developing another strategy to meet native shrub establishment will be determined upon establishing the ESD.

**Native Grasses:** Reclaimed sites must have growth forms and plant diversity representative of the ESD reference site. These are to be planted at rates appropriate to achieve abundance and diversity characteristic of those found in the ESD reference site. Timeframes to determine whether replanting or developing another strategy to meet native grass establishment will be determined upon establishing the ESD.

**Non-Native and Invasive Species:** Reclaimed sites must be free from all species listed on the Wyoming Noxious Weed List. All local, state, and federal invasive<sup>1</sup> plant laws and regulations must be adhered to. Other highly competitive invasive plants, such as downy brome grass, will be controlled. Site specific weed management plans will address management goals and priorities.

**Plant Vigor:** Plants must be resilient as evidenced by well-developed root systems, flowers, and seed heads. All sites to be considered reclaimed must exhibit the sustainability of the above desired attributes. A minimum of one growing season without external influences (irrigation, mat pads, fences, etc.) may satisfy this requirement.

## Final Reclamation Criteria

### Ground Cover and Ecological Function

To ensure soil stability and nutrient cycling, canopy must be equal to or greater than the pre-disturbance  
*Rock Springs RMP Revision*

composition and vegetative litter must be decomposing into the soil.

### **Vegetative Criteria**

**Native Forbs:** The average percent composition and total diversity of forbs must be equal to or greater than pre-disturbance composition. Timeframes to determine whether replanting or developing another strategy to meet native forb establishment will be determined upon establishing the ESD.

**Native Shrubs:** The average frequency of the shrub component must be at least 80% of pre-disturbance composition within eight years. This includes both shrubs and half shrubs (e.g. winterfat, fringed sage, etc.). At least 25% density or frequency of the shrub component must be the dominant species from the reference site. The diversity of shrubs must be equal to or greater than the reference site.

**Native Grasses:** Reclaimed sites must exhibit grass percent composition equal to the reference site. Timeframes to determine whether replanting or developing another strategy to meet native grass establishment will be determined upon establishing the ESD.

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<sup>1</sup> *Invasive species. A species that is not native (or is alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health (Executive Order 13112).*

**Non-Native/Noxious/Invasive Weeds:** Sites must be free from all species listed on the Wyoming and Federal noxious weed list. All state and federal laws regarding non-native species and noxious weeds must be followed. Aggressive action to eliminate highly competitive invasive species such as cheatgrass and other invasive brome grasses must be taken to prevent spread.

**Plant Vigor:** Plants must be resilient as evidenced by well-developed root systems and flowers. Shrubs will be well established and will exhibit age class structure.

### **An Alternative Determination for Reclamation Success**

Standards for success will be developed based on performance-based criteria and the ESD. The objectives for each reclamation plan are set with site specific criteria at the field office level, thereby maximizing the unique conditions within each field office.

#### **I.2.6 Weed Management**

- Control the spread of and/or eradicate noxious weeds or other invasive species infestations.
- Mitigation will be applied to all activities to control noxious weeds or other invasive species.
- Weed control will be achieved through Integrated Pest Management approach.
- All vegetation treatments will be assessed for the potential to introduce invasive species before a treatment method is selected.
- BLM will support and cooperate with efforts to manage and control noxious weeds or other invasive plant species, including collaboration with local plans and control efforts.
- All approved revegetation plans will include a weed management plan.

#### **I.2.7 Monitoring**

1. Standard Monitoring Requirements:
  - a. Project proponents must use the same locations and methods used at baseline for repeat photography. Additional locations may be selected to document progress of reclaimed area to demonstrate interim<sup>2</sup> and final reclamation<sup>3</sup> success, and to monitor any identified problems such as erosional features. The site should be photographed once every year normally at the same time period, from the same locations and direction so that photographs are repeated through time. Photographs should be taken during the growing season.

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<sup>2</sup> Interim reclamation may proceed if a project will be dormant for an undetermined amount of time, to provide cover to prevent erosion events and to provide forage for wildlife).

<sup>3</sup> Final reclamation occurs when all activities on the location have been completed, recontouring occurs and the seed mix contains all species necessary for habitat recovery.

- b. Weed inventory: Disturbed and reclaimed areas will be evaluated for noxious and invasive weeds annually until the timeline determined by the ESD has been satisfied. A weed control plan will be written separately under the BLM Integrated Weed Management Program.
  - c. Erosion control/soil stability: The reclaimed area should be evaluated for any signs of erosion problems annually (until the timeline determined by the ESD has been satisfied) and when the site is subject to erosional events. Identified erosion features should be monitored using repeat photography. Absence of erosion features is a positive indication that the soil is stabilizing.
  - d. Hydrological function measurements should be documented using Technical Note #346 Erosion condition classification system and the determination of erosion condition class sheet to ensure the of erosion control methods worked during the development phase and the final pad contouring; resulting in the return of the original hydrologic function of the site.
  - e. Restoration of the landforms visual resource should also be documented, whether returning the location to the original visual classification under the RMP or the original topographic features.
  - f. Wildlife habitat communities should be monitored to ensure that the goals for sensitive wildlife species are also being met. Reclamation actions will be initiated before the first growing season following disturbance.
2. Following each growing season:
    - a. Review and complete a site-specific vegetation monitoring report for areas being reclaimed.
    - b. Prepare a written, site-specific prescription for actions to be implemented, including:
      - Reseeding of areas not attaining reclamation success
      - Soil stabilization
      - Weed control needs
      - Mulching/fertilization or other cultural practices prescribed for the following season.
  3. If the treatment area is found, through site-specific monitoring data, to be successfully reclaimed, monitoring to confirm reclamation success will continue until the timeline determined by the ESD has been satisfied. The site will also comply with additional management needs, including control of weed infestations.
  4. Within one to three years of initiation of reclamation, sites will demonstrate the establishment of a viable desirable seedling frequency. (Pro-action may want to be taken if reclamation is not successful during a good moisture year.) Desirable seedling density or frequency, compared to pre-disturbance composition information, shall consist of a vigorous, diverse, native (or otherwise approved) plant community or ecologically comparable species as approved by BLM AO. If this does not occur the project proponent should coordinate with the BLM, NRCS, WGFD, or other local experts to determine an alternative course of action to ensure full site recovery, the actions prescribed will be implemented as planned and further monitoring will occur as detailed beginning with the first action listed above.

If at any time pre-disturbance composition data is not suitable for reclamation success determinations, the project proponent may select a desired plant community in the reference state from the ESD State and Transition model.

## I.2.8 Standard Reporting

The project proponent will provide the BLM with an annual report for all sites disturbed. The report will include:

- Copies of the completed individual site review forms or a BLM-approved electronic report.
- A summary of monitoring data and results, including:
  - Individual site reclamation monitoring reporting data (Table A36-1)
  - Identification of sites successfully reclaimed by reclamation years (starting with the first growing season)
  - Identification of sites needing additional work or more reclamation activities (adaptive management) by reclamation year
  - Sites proposed for the end of monitoring (i.e., sites that were successfully reclaimed).
- The BLM's useable shape file(s) or geographic information system (GIS) layer(s) that details location, name, type, and extent of:
  - New disturbances
  - Unreclaimed disturbance
  - New reclamation
  - Failed or unsuccessful reclamation
  - Locations of noxious/invasive weed infestation
  - Further vegetation treatments planned (e.g., mulching, matting, and weed control).

On these shape files or GIS layers, *location* shall be given as the legal location and geo-referenced location of the site; *name*, as appears on the BLM Application for Permit to Drill (APD), lease, or other BLM file name for the site; *extent*, as the appropriate component boundary.



### QUALITATIVE MONITORING SHEET

Well Name/ Number \_\_\_\_\_

Monitoring Date \_\_\_\_\_

Company \_\_\_\_\_

Inspector \_\_\_\_\_

Well Pad     Access Road     Pipeline     Other \_\_\_\_\_

Topsoil Storage     Stockpile (> 3ft)     Stockpile (< 3ft)     Direct Haul     None

Length of Topsoil Storage (months) \_\_\_\_\_

Seeding Method     Broadcast     Drill     Other \_\_\_\_\_

Date Seeded \_\_\_\_\_    Seed Mix \_\_\_\_\_

Soil Amendment \_\_\_\_\_    Date of Amendment Application \_\_\_\_\_

Item	Monitoring Requirement	Description	Yes	No
1	Is seed germination apparent?	Seeds have germinated, seedlings are emerging.		
2	Is the area free of undesirable materials?	Trash, construction materials, etc.		
3	Is the soil stable with no indications of subsidence, slumping and/or significant erosion?	Rills greater than 2 inches, accelerated erosion is obvious and soils are not being held by plants on site, sheet flow, head cutting in drainages, slopes occurring on or adjacent to reclaimed areas.		
4	Absence of noxious weeds?	Perennial pepperweed, Canada thistle, black henbane, leafy spurge, yellow or Dalmatian toadflax, spotted knapweed, Russian knapweed, etc.		
5	Absence of other undesirable species?	Cheatgrass, Halogeton, Russian thistle, etc.		
6	Is there evidence of good reproductive capability?	Seed production is evident. Amount of tillers, rhizomes, flowers, and/or seed stalks are comparable to the reference site. To answer yes, must have for all three plant types: grass, forb, and shrub.		

Item 7: Year of Reclamation

Years 2 - 3     Years 4 - 5     Years 6 -7     Years 8+

If any of the items are answered “No” above, please identify the problem, attach explanation and photographs, and contact BLM Reclamation Specialist.

Tech Note #346  
 U.S. Department of the Interior- Bureau of Land Management  
 Erosion Condition Classification System by Ronnie Clark

Well name and number: \_\_\_\_\_

Date: \_\_\_\_\_

Operator: \_\_\_\_\_

Collector: \_\_\_\_\_

Erosional Feature	Potentially Present Yes/No	Identified Factors (Form 7310-12)	Possible Factor
Soil Movement			14
Surface Litter			14
Surface Rock Fragments			14
Pedestalling			14
Flow Patterns			15
Rills			14
Gullies			15
Column Totals			
<b>Soil Surface Factor Total</b>			
<b>Class</b>			

SSF	Class
1-20%	Stable
21-40%	Slight
41-60%	Moderate
61-80%	Critical
81-100%	Severe

**Procedure:**

1. Observe the total sample area and determine an average condition for each of the seven items above.
2. Determine if each item is potentially present as only these items will be considered.
3. For the items potentially present, indicate appropriate numerical value. (Form 7310-12)
4. Total both the weighted values and the potential values for each item.
5. Calculate the total percent SSF: (Identified factors / possible factors) X 100.
6. Indicate corresponding condition class site is in.

**Comments:**

Form 7310-12  
 Determination of Erosion Condition Class  
 Soil Surface Factor (SSF)

Well Name/Number: \_\_\_\_\_

Date: \_\_\_\_\_

Operator: \_\_\_\_\_

Collector: \_\_\_\_\_

<b>Soil Movement</b>	Depth of recent deposits around obstacles, or in microterraces; and/or depth of truncated areas, is 0 – 0.1 in (0 – 2.5 mm). 0 or 3	Depth of recent deposits around obstacles, or in microterraces; and/or depth of truncated areas, is 0.1 – 0.2 in (2 – 5 mm). 5	Depth of recent deposits around obstacles, or in microterraces; and/or depth of truncated areas, is 0.2 – 0.4 in. (5 – 10 mm) 8	Depth of recent deposits around obstacles, or in microterraces; and/or depth of truncated areas, is 0.4 – 0.8 in. (10 – 20 mm) 11	Depth of recent deposits around obstacles, or in microterraces; and/or depth of truncated areas, is > 0.8 in. (20 mm) 14
<b>Surface Litter</b>	No movement, or if present, < 2% of the litter has been translocated and redeposited against obstacles. 0 or 3	2 – 10% of the litter has been translocated and redeposited against obstacles. 6	10 – 25% of the litter has been translocated and redeposited against obstacles. 8	25 – 50% of the litter has been translocated and redeposited against obstacles. 11	> 50% of the litter has been translocated and redeposited against obstacles. 14
<b>Surface Rock Fragments</b>	Depth of soil removal around the fragments, and/or depth of recent deposits around the fragments is < 0.1 in (2.5 mm). 0 or 2	Depth of soil removal around the fragments, and/or depth of recent deposits around the fragments is 0.1 – 0.2 in. (2.5 – 5 mm). 5	Depth of soil removal around the fragments, and/or depth of recent deposits around the fragments is 0.2 – 0.4 in. (5 – 10 mm). 8	Depth of soil removal around the fragments, and/or depth of recent deposits around the fragments is 0.4 – 0.8 in. (10 – 20 mm). 11	Depth of soil removal around the fragments, and/or depth of recent deposits around the fragments is > 0.8 in. (20 mm). 14
<b>Pedestals</b>	Pedestals are mostly < 0.1 in (2.5 mm) high and/or have a frequency < 2 pedestals/100 ft. 0 or 3	Pedestals are mostly 0.1 – 0.3 in. (2.5 – 8 mm) high and/or have a frequency of < 2 – 5 pedestals/100 ft. 6	Pedestals are mostly 0.3 – 0.6 in. (8 – 15 mm) high and/or have a frequency of < 5 – 7 pedestals/100 ft. 9	Pedestals are mostly 0.6 – 1 in. (15 – 25 mm) high and/or have a frequency of < 7 – 10 pedestals/100 ft. 11	Pedestals are mostly > 1 in. (25 mm) high and/or have a frequency of > 10 pedestals/100 ft. 14
<b>Flow Patterns</b>	If present, < 2% surface area shows evidence of recent translocation and deposition of soil & litter. 0 or 3	2 – 10% surface area shows evidence of recent translocation and deposition of soil & litter. 6	10 – 25% surface area shows evidence of recent translocation and deposition of soil & litter. 9	25 – 50% surface area shows evidence of recent translocation and deposition of soil & litter. 12	> 50% surface area shows evidence of recent translocation and deposition of soil & litter. 15
<b>Rills</b>	If present, are < 0.5 in (13 mm) deep and at intervals > 10 ft. 0 or 3	Rills are mostly .5 – 1 in. (13 – 25 mm) deep, and at intervals > 10 ft. 6	Rills are mostly 1 – 1.5 in. (25 – 38 mm) deep, and at intervals > 10 ft. 9	Rills are mostly 1.5 – 3 in. (38 – 76 mm) deep, and at intervals > 10 ft. 12	Rills are mostly 3 – 6 in. (76 – 152 mm) deep, and at intervals > 5 ft. 14
<b>Gullies</b>	If present, < 2% of the channel bed and walls show active erosion (no vegetation), gullies make up < 2% total area. 0 or 3	2 – 5% of the channel bed and walls show active erosion (no vegetation), gullies make up 2 – 5% total area. 6	5 – 10% of the channel bed and walls show active erosion (no vegetation), gullies make up 5 – 10% total area. 9	10 – 50% of the channel bed and walls show active erosion (no vegetation), gullies make up 10 – 50% total area. 12	Over 50% of the channel bed and walls show active erosion (no vegetation), gullies make up > 50% total area. 15

# ATTACHMENT A—RECOMMENDED RECLAMATION PRACTICES FOR ENSURING SUCCESSFUL AND TIMELY ECOSYSTEM RECLAMATION

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## RECOMMENDED BEST MANAGEMENT PRACTICES FOR HANDLING SUITABLE SOILS TO MAINTAIN SOIL QUALITY

### SUGGESTIONS ON STOCKPILING SUITABLE AND UNSUITABLE SOILS TO MAINTAIN SOIL QUALITY

*The methods suggested in this section have been documented to improve reclamation success; however, it is up to the project proponent to utilize their judgment, expertise, and the latest research and information to achieve desired results.*

Stockpiled topsoil should not be piled too deeply or too shallow. The taller or deeper the piles the more soil is buried under large amounts of pressure resulting in compaction. Soil buried deep in the pile also has little exposure to oxygen resulting in anaerobiosis; deeply buried soil also has no organic matter input. Both of these problems reduce soil quality.

Shallow or small topsoil stockpiles have large footprints on the land surface with the disadvantage of covering greater areas of undisturbed soil which will, in turn, require revegetation, resulting in a greater overall amount of disturbed soil. Smaller or shallow stockpiles also have a greater surface area per amount of soil stored which increases exposure of the stockpiled soil to wind and water erosion. The surface of soil stockpiles should always be vegetated to minimize erosion losses.

- Salvaged stockpiles of suitable soil should be no deeper than four meters (13 feet) and should be less where possible with the understanding that greater surface disturbance may occur.
- Stockpile slopes should not exceed 5:1 angles (20% slopes) to allow for seeding and minimize erosion.
- Suitable soil stockpiles should be located in areas to prevent their disturbance and contamination by project activities. They should not be placed in streambeds or ephemeral drainages where they may be washed away. They should be protected from wind erosion.
- A perimeter ditch/berm can be constructed around the stockpile for topsoil conservation and sediment control where necessary.
- All suitable soil stockpiles should be seeded with native cool season grass to provide cover and protect them from water and wind erosion. Before seeding, the stockpile may be scarified along contours to minimize wind and water erosion.
- If soil horizons or layers are to be stratified during soil salvage (stripping) operations, soil maps should be made of the well pad area to identify depths of soil horizons and surface slope. The area to be cleared of soils should then be divided into strips the size of the blades or equipment being used for soil removal. The depth of soil removal from each swath should be clearly marked so that equipment operators are removing a uniform layer from each strip. After the topsoil is removed

from the area in this manner, the subsoil can then be removed in the same fashion, strip by strip, each strip at a uniform depth.

## SOIL AMENDMENTS

- Soil amendment(s) may be used in reclamation if the soil is lacking the necessary chemical, biological, physical and/or organic materials to support sustaining growth of suitable plant materials. The soil type, soil characteristics, geographic location, along with soil mapping resources available should provide the information necessary to define the soil amendment.
- The Project Proponent should state what applying soil amendments is intended to accomplish. Soil amendment plans should be provided, including what amendments will be applied, method of application, and timing relative to other reclamation activities (i.e. stockpiling, seeding, and ripping).
- The soil type is defined by the soil samples obtained prior to, or in some cases, after disturbance takes place. Soil amendments must be scientifically calculated based on the soil characteristics to provide the most cost efficient and best assurances for successful reclamation.
- Soil amendments include but are not limited to the following: Weed free grass hay, weed free wood chips or other weed free cellulosic materials, gypsum, elemental sulfur, and fertilizer.

## Limited Reclamation Potential (LRP)

Areas possessing unique landscape characteristics such as sensitive geologic formations, extremely limiting soil conditions, biological soil crusts, badlands, rock-outcrops, etc., often make reclamation success impractical and/or unrealistic due to physical, biological, and/or chemical challenges. When disturbed, these areas may require unconventional reclamation strategies to address the requirements established by the Wyoming Reclamation Policy and the HDD Policy for Reclamation of Disturbed Lands.

LRP areas such as powdery soil, moisture limited soils, etc., would be avoided if mitigating/reclaiming them is not possible. Pre and post construction soil sampling would be required in these areas. Seed collection or transplanting plants may be required to reestablish these areas.

## SUGGESTIONS ON VEGETATION AND SOIL MONITORING

Examples of monitoring components are listed below:

- Reference: <http://agriculture.wy.gov/forms/natres/rangelandmonitoring.pdf>

## SUITABLE SOIL INVENTORY

- Soil characteristics may strongly influence reclamation efforts. Fundamental characterization of soils ahead of disturbance can identify potential problems, so they can be addressed during disturbance, soil stockpiling and reclamation, instead of waiting for reclamation failure.
- The phrase “suitable soil” is used mainly because of confusion over the definition of topsoil. Soil depth, pH, electrical conductivity, texture, surface features (e.g. barren, rocky, crusty, plant litter), and organic matter content are characteristics that may be used to determine if a soil is suitable. Other information may be needed. See: “Successful restoration of severely disturbed lands:

Overview of critical components,” B-1202, (and available for free at <http://ces.uwyo.edu/PUBS/B1202.pdf>).

- Soil characteristics that can signal a high probability of reclamation problems include: pH, electrical conductivity, soil texture, surface/subsurface features, sodium adsorption ratio, calcium carbonate content, soil compaction, and saturation percentage. The listed characteristics below will be addressed by the Proponent in the site-specific reclamation plan approved by the BLM.
  - Soils with pH 7.8 and higher progressively become less suitable for reclamation and will be addressed by the Operator in the site-specific reclamation approved by the BLM.
  - An electrical conductivity of soil greater than eight deciSiemens per meter (dS/m) and any increase in salt content of the soil above 0.5 dS/m will progressively negatively affect the establishment and growth of plants. Soils exhibiting these characteristics will be addressed by the Operator in the site-specific reclamation plan approved by the BLM.
  - Soils with textures representing clay, sand, or loamy sand will be addressed by the Operator in the site-specific reclamation plan approved by the BLM.
  - Surface and subsurface soil in and through the root zone dominated by coarse material greater than two millimeters in diameter and greater than 40% in the soil profile to be stockpiled may signify reclamation difficulties and will be considered in the site-specific reclamation plan by the BLM and Proponent.
  - Sodium adsorption ratio (SAR) is a key diagnostic soil trait that may be determined for soils to be disturbed and placed in the suitable soil stockpile and will be addressed by the Operator in the site-specific reclamation plan approved by the BLM.
  - Calcium carbonate content (percent lime) will control the amount of plant available phosphorus and will be determined in the site-specific reclamation plan by the Operator and approved by the BLM.
  - The soil saturation percentage will control the ability for plants to germinate and survive after reclamation actions have been taken by the Operator and will be addressed by the Operator in the site-specific reclamation plan approved by the BLM.

## **SITE PREPARATION**

It is important to consider diversity in seedbed preparation to account for various seed sizes and establishment strategies of different species. Consideration should be given for seed-safe sites, water infiltration and collection, shade, and frost protection.

## **RECONTOURING**

Trees, shrubs, and ground cover adjacent to disturbance areas but not cleared from rights-of-way (ROW) require protection from construction damage. Recontouring to preconstruction condition as well as restoration of normal surface drainage is required.

## **ROAD RECLAMATION GUIDELINES**

Road reclamation guidelines are as follows:

- Determine the desired level of obliteration and reclamation. Determine whether there are alternative short- or long-term uses for roads.

- Determine short and long-term reclamation objectives and goals. Identify the monitoring methods to determine reclamation success or failure and possible mitigation.
- Reclaim the road; the effort may include ripping and scarifying the surface, removing culverts and other flow structures, recontouring cut and fill slopes to provide for complete removal of the road, and total recontouring to the original topographic profile.
- Reclaim vegetation to standards outlined in the section on “criteria for reclamation.”
- Establish mitigation measures to remedy problems identified by monitoring.

## **NON-NATIVE AND INVASIVE SPECIES**

One of the land management agencies’ highest priorities is to promote ecosystem health, and one of the larger obstacles to achieving this goal is the rapid expansion of non-native and invasive species across public lands. Invasive plants can dominate sites and often cause long-term changes to native plant communities. If not eradicated or controlled, invasive species will jeopardize the success of reclamation. Invasive species can slow reclamation success or halt it altogether. Right-of-Way (ROW), mineral lease, mining claim, and permit holders are required to monitor and control invasive species on public land as stipulated within their permits and authorizations.

## **INVASIVE PLANT MANAGEMENT PLAN FOR CONSTRUCTION AND RECLAMATION ACTIVITIES**

Disturbed sites can provide ideal opportunities for invasive plant species to propagate. Invasive plants can be transferred to the disturbed site from adjoining areas and out-compete desired vegetation during reclamation and/or spread to new areas. The best approach to combat invasive species is to use careful suitable soil handling and an appropriate seed mix. Pre-disturbance planning, including early weed management for invasive species is vital to reduce costs and ensure successful reclamation.

- Assess for noxious and invasive weed species before initiating surface disturbing activities, during disturbance, during interim and final reclamation, and after reclamation is completed.
- Web address for the Wyoming Weed and Pest Council: <http://www.wyoweed.org/>.
- Apply invasive species control treatments.
- Monitor invasive plant species at least annually to evaluate success of control treatments and determine if continued treatment is necessary.

The vegetation will consist of species included in the seed mix and/or occurring in the surrounding natural vegetation or as deemed desirable by land management agencies in review and approval of the reclamation plan. No single species will account for more than 30% total vegetative composition unless it is evident at higher levels in the adjacent landscape. Vegetation canopy cover production and species diversity shall approximate the surrounding undisturbed area.

## **SEED**

On all areas to be reclaimed, seed mixtures are required to be certified noxious weed free and site specific, composed of the same native species as determined in the Desired Plant Community/ESD or early

successional species consisting of pioneer species, including seasonal or annual species (that may only be evident at certain times of the year), that will lead to a similar climax community as that disturbed. Site preparation and species choices must ensure soil stability.

A Desired Plant Community/ESD species composition list must be developed for each site to ensure proper community composition, function, and structure. This will ensure that the type of vegetative community replaced is compatible with climate and soil types and should make it easier for the project proponent to successfully restore and stabilize specific sites.

Livestock palatability and wildlife habitat needs should be given consideration in seed mix formulation during reclamation within areas of important wildlife habitat (crucial winter range, etc.); provision shall be made for the replacement of native browse and forb species. Bureau of Land Management guidance for native seed use is the BLM Manual 1745 and Executive Order (E.O.) 13112 (Invasive Species, 64 Code of Federal Regulations [CFR] 6183).

## DESCRIBE SEEDING METHODS

- Different plant species may require different conditions (e.g. seeding depth, seed scarification, mixing, and timing) for optimal germination success. Seeding methods should match germination characteristics of species in the seed mix and consider timing of planting to maximize germination and establishment of all reclamation species.
- The Proponent will describe when seeding will occur and specify the methods they will use for seeding, including differential handling for different species (e.g. broadcast vs. drilling vs. imprinting), and seeding depth in the site-specific reclamation plan. Re-seeding may need to occur if invasive and/or noxious weeds prevent establishment of the seed mix.

A germination test for Pure Live Seed (PLS) basis should be used (<http://efotg.sc.egov.usda.gov/references/public/WY/pm6.pdf>).

## Germination Test

A germination test samples for total viability, including the sum of all seeds (of a “kind” listed on the label) actually germinating using standard laboratory methods plus hard seed and/or dormant seed.

**Percent Germination:** A germination test determines the capability of a seed lot to produce normal seedlings under favorable controlled conditions. Total germination is the percent germination added to the percent hard and/or dormant seed. Anything under 100% total germination represents the presence of dead seed and/or seed that doesn’t produce a shoot or root. Germination may also be estimated by the use of a tetrazolium chloride test (TZ test) in which seeds are stained with a dye to determine viability. Viable seed with live (respiring) tissues will stain a red color. However, not all states recognize the use of a TZ test for all species.

**Dormant Seed:** Includes hard seed, refers to the portion of the seed sample that doesn’t germinate during the seed test. Reasons for dormant seed are: 1) the seed coat is impervious to water, and/or 2) internal structures within the seed prohibit oxygen exchange. Hard seed may germinate at a later date and produce a viable plant, or it may germinate and succumb to competition, or it may never germinate at all.



The higher the germination percentage, the better. Germination of most grass species is normally above 80% and should not be lower than 60%. Germination of some native grasses, forbs, and shrubs may be lower, but can vary widely according to species.

The germination test date should also be current. Grass, forb and legume seed should be updated every nine to 18 months depending on state laws. Flower, shrub, and tree seed should be updated every nine months.

## STANDARD SEED MIXTURES

Care and planning must be taken to choose mixes and amounts that will benefit under site-specific conditions. Planning and thought must also go into selecting successful planting and site-preparation techniques. All sites must be planted with a diverse mix of grasses, forbs, and shrubs to be considered successful. The project proponent is ultimately responsible for successful restoration of disturbed sites. Seed mixes should be based on and the Desired Plant Community that is achievable according to the ESD. When appropriate native plant materials are not commercially available, use of local collections or adapted species that perform similar function may be used in lieu of the exact species described the ESD that has been shown to be successful in previous trials. Return of cover should be gauged by comparison with actual pre-disturbance site conditions and/or reference areas. Alternate seed mixes can be submitted by the project proponent to the BLM for review and approval prior to use. The final goal is to restore disturbed sites so that they closely resemble predisturbance native plant communities. Some standard seed mixes are available for the Field Office and contain only native species. If the use of a non-native species is desired, documentation of the need is required by the BLM policy. Non-native species may be considered for erosion and weed control. Seed mixtures consisting of sterile annual cover crops, such as triticale hybrid, can be used. Non-native species may be considered in some circumstances to aid the revegetation of native species as outlined in the Wyoming Reclamation Plan. As stated in the Wyoming Reclamation Plan (IM WY2012-032) “Select non-native plants only as an approved short term and non-persistent (i.e. sterile) alternative to native plant materials. Ensure the non-natives will not hybridize, displace, or offer long-term competition to the endemic plants, and are designed to aid in the re-establishment of native plant communities.” Follow-up seeding or corrective erosion control measures will be required on areas of surface disturbance that fail to meet reclamation success standards within a reasonable time.

## SEED MIXES

The need to provide multifunctional and sustainable seed mixes for interim and final reclamation and soil stability is driven by a desire to increase potential for successful and timely re-vegetation and site stability. Plant diversity and habitat functionality are directly impacted by the seed choices applied to an area slated to be reclaimed or restored. To maintain as much stability and ecological function this section makes recommendations to specifically aid a proponent’s selection process.

- Select site-appropriate, adapted native plant materials based on the ESD, Desired Plant Community, and commercially available native species adapted to the species identified in the Desired Plant Community/ESD. Seeds may be obtained from commercial sources of certified weed-free seed mixes. Alternatively, local collections may be used provided they are collected in an area without weedy species. Any seed used for reclamation should be certified weed free and have the same standards required as commercially purchased seed.
- Perennial naturalized species may be used when attempts to reclaim using native plants have not succeeded for a minimum of five full growing seasons. Reclamation should succeed using native species if soils are properly managed, precipitation is not limiting, seed mixes are carefully selected, and seeded areas protected from grazing.

- Based upon site-specific conditions, a decision may be made to use non-natives sooner than identified above and will be used in only unique conditions defined in the site-specific reclamation plan and approved by the AO.

## MULCH

Use of mulch during reclamation may enhance chances for successful vegetation reestablishment. Mulches can help control wind and water erosion, retain and collect seed, increase and prolong soil water capacity, and add organic compounds to the soil. Mulches are best applied after seeding to ensure proper seed contact with soil. Mulch may include hay, small-grain straw, wood fiber, live mulch, cotton, jute, or synthetic netting. Straw mulch should contain fibers long enough to facilitate crimping and provide the greatest cover.

When mulching with cereal grain straw or grass hay, apply in sufficient amounts to provide 70% ground cover. Mulch rate shall be determined using current erosion prediction technology to reach the soil erosion objective (NRCS 2005).

When mulching with wood products such as wood chips, bark, or shavings or other wood materials, apply to a 2-inch thickness if the soil is not well-drained and to a 3- to 4-inch thickness if drainage is good. More finely textured mulches, which allow less oxygen penetration than coarser materials, should be no thicker than one or two inches. The mulch material shall provide no greater than 80% ground cover in order to ensure adequate air drainage (NRCS 2005).

Gravel or other inorganic material shall be applied approximately two inches thick and shall consist of pieces 0.75 inch to two inches in diameter. The mulch material shall provide no more than 90% ground cover in order to ensure adequate air drainage (NRCS 2005).

Mulch shall be applied at a rate that achieves 50% ground cover to provide protection from erosion and runoff and yet allow adequate light and air penetration to the seedbed to ensure proper germination, emergence, and disease suppression (NRCS 2005).

Any mulch used must be certified free from noxious or invasive weed seeds.

## LIVE PLANTINGS

Live plants can be planted on disturbed sites and, with proper site preparation, can greatly enhance restoration efforts and shorten time frames. Proponents can buy bare root and container stock directly from vendors or can contract seed collection and growth from local growers. Another strategy is to use an excavator to collect clumps of plants from the site and plant them either on reserved topsoil piles and/or on restoration sites during recontouring. These clumps can provide native seed and soil flora as well as collect precipitation and provide shade for newly emerging plants.

## **APPENDIX J—SEASONAL WILDLIFE RESTRICTIONS**

### **J.1 ALTERNATIVE A**

**Table J-1. Seasonal Wildlife Restrictions**

<b>Affected Areas</b>	<b>Restriction</b>	<b>Restricted Area</b>
Big game crucial winter range	November 15-April 30	Pronghorn, elk, moose, and mule deer crucial winter ranges
Big game birthing areas	May 1-June 30	Designated birthing areas
Elk calving areas	May 1-June 30	Designated calving areas
Mountain plover aggregation areas	April 10-July 10	¼ mile of aggregation areas
Golden eagle	February 1 – July 31	½ mile of active nests
Ferruginous hawk	February 1 – July 21	1 mile of active nests
Other raptors	February 1 – July 31	½ mile of active nests

### **J.2 ALTERNATIVE B**

**Table J-2. Seasonal Wildlife Restrictions**

<b>Affected Areas</b>	<b>Restriction</b>	<b>Restricted Area</b>
Big game crucial winter range	November 15-April 30	Pronghorn, elk, moose, and mule deer crucial winter ranges
Big game birthing areas	May 1-June 30	Designated birthing areas
Fisheries	March 15-July 31 and September 15-November 30	Within a ¼ mile of riparian areas
Mountain plover aggregation areas	April 10-July 10	¼ mile of aggregation areas
Raptors	February 1 – July 31	Within 2 miles of active and historic nests

### **J.3 ALTERNATIVE C**

**Table J-3. Seasonal Wildlife Restrictions**

<b>Affected Areas</b>	<b>Restriction</b>	<b>Restricted Area</b>
Big game crucial winter range	November 15-April 30	Pronghorn, elk, moose, and mule deer crucial winter ranges
Big game birthing areas	May 1-June 30	Designated birthing areas
Mountain plover aggregation areas	April 10-July 10	100 feet of aggregation areas
Raptors	February 1 – July 31	Within ½ mile of active nests

## J.4 ALTERNATIVE D

**Table J-4. Seasonal Wildlife Restrictions**

<b>Affected Areas</b>	<b>Restriction</b>	<b>Restricted Area</b>
Big game crucial winter range	November 15-April 30	Pronghorn, elk, moose, and mule deer crucial winter ranges
Big game birthing areas	May 1-June 30	Designated birthing areas
General raptor	March 1-August 15	½ mile of occupied and historic nest sites
Bald eagle	February 1-August 15	2 ½ miles of occupied and historic nest sites
Burrowing owl	April 1-September 15	¼ mile of occupied and historic nest sites
Ferruginous hawk	February 1-July 31	1 mile of occupied and historic nest sites
Golden eagle	February 1-July 31	½ mile of occupied and historic nest sites
Mountain Plover	April 10 – July 10	¼ mile of active nest
Migratory birds	February 1 – July 31	Immediate area of nest
Fisheries	March 15 – July 31 September 15 – November 30	Fish bearing streams

## APPENDIX K—LAND TENURE ADJUSTMENT CRITERIA

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The Federal Land Policy and Management Act of 1976 (FLPMA) provides for retention of the public lands in federal ownership and management by the Bureau of Land Management (BLM) for multiple uses. FLPMA and other federal laws, executive orders, and policies suggest criteria to use when categorizing public lands for retention or disposal, and for identifying acquisition priorities. Disposal by sale, exchange, or Recreation and Public Purpose (R&PP) patent remains an option if such an action would serve an important objective and have a public benefit.

The following is a list of suggested criteria to consider in land tenure adjustment proposals, but it is not considered all-inclusive. These criteria are meant to guide and streamline consideration of land tenure adjustment proposals.

Criteria for Retention or Acquisition:

- Important, crucial, or critical habitat for fish, wildlife, and plants
- Riparian areas and wetlands
- Parcels that provide access to larger blocks of public land
- Lands with special designation or management emphasis
- Significant cultural resources
- Recreation opportunities and benefits
- Contaminated and physical hazard conditions
- Mineral development potential.

Criteria for Disposal:

- Parcels difficult or costly to administer
- Parcels more suitable for management by another federal or state agency
- Parcels of special importance to local communities.

Transfer to other public agencies will also be considered if improved management efficiency would result. Prior to any disposal, a site-specific analysis must determine that the lands considered contain no significant wildlife, recreation, or other resource values, the loss of which could not be mitigated, have no overriding public values, and represent no substantial public investments. Land tenure adjustments must serve the public interest. Exchange will be the preferred method for disposals.

### K.1 EXCHANGES

Land exchanges are the preferred method of land tenure adjustments, based on the following criteria:

- Land exchanges that serve the national interest and are beneficial to BLM programs or that support the programs of other agencies (reference Sections 102, 205, and 206 of FLPMA) would be promoted.
- Transfer of leasable minerals out of federal ownership should be avoided except when non-federal leasable minerals are to be received in return. It is preferable to trade both surface and subsurface (mineral) estates.
- Exchanges should involve lands similar in character and/or value. Lands acquired by the BLM in

an exchange will be retained under federal ownership or control.

- Land considered for disposal by exchange will include reservations for public and administrative access to adjacent Federal and state managed lands.
- Exchanges for consolidation of ownership within BLM and Congressionally designated management units.
- Exchanges should not be made solely for the purpose of blocking up federal land ownership.

## **K.2 SALES**

Public land sale proposals are the result of a BLM initiative or in response to expressed public interest or need. Lands to be considered for disposal, at a minimum, must meet the following criteria as outlined in Section 203 of the FLPMA:

- They are difficult and uneconomical to manage and are not suitable for management by another federal department or agency.
- Disposal would serve important public objectives, including but not limited to, community expansion or economic development, that could not be achieved prudently or feasibly on land other than public lands and that outweigh other public objectives or values.
- The tract was acquired for a specific purpose, and the tract is no longer required for that purpose or any other federal purpose.
- Land sales will include reservations for public and administrative access to adjacent Federal and state managed lands.

## **K.3 SALES AND EXCHANGES INVOLVING WETLANDS**

Bureau policy is to retain wetlands in federal ownership unless federal, state, public, and private institutions, and parties have demonstrated the ability to maintain, restore, and protect wetlands and riparian habitats on a continuous basis (BLM Manual 6740). Sales and exchanges may be authorized when:

- The tract of public wetlands is either so small or remote that it is uneconomical to manage.
- The tract of public wetlands is not suitable for management by another federal agency.
- The patent contains restrictions of uses as prohibited by identified federal, state, or local wetlands regulations.
- The patent contains restrictions and conditions that ensure the patentee can maintain, restore, and protect the wetlands on a continuous basis.

## **K.4 RECREATION AND PUBLIC PURPOSES LEASE/PATENT**

The objective of the R&PP Act is to meet the needs of state and local governmental agencies and other qualified organizations for public lands required for recreational and public purposes. Use of the R&PP Act protects public values in the land through its reversionary provisions and helps qualified entities obtain the more liberal pricing authorized under the Act.

Public lands shall be conveyed or leased only for an established or definitely proposed project for which there is a reasonable timetable of development and satisfactory development and management plans. No more land than is reasonably necessary for the proposed use shall be conveyed.

## K.5 DESERT LAND ENTRIES

The purpose of the Desert Land Law is to permit the reclamation by irrigation of arid public land through individual effort and private capital (reference 43 Code of Federal Regulations §2520), based on the following criteria:

- Lands that will not produce any reasonably remunerative agricultural crop by the usual means or methods of cultivation, without artificial irrigation, may be considered for a desert land entry. The lands must be untimbered, surveyed, unreserved, and unappropriated. Tracts need not be contiguous, but shall be sufficiently close to each other to be managed satisfactorily as an economic unit.
- The proposed crop may include any agricultural product to which the land under consideration is generally adapted and which would return a fair reward for the expense of producing it.
- All Desert Land Entry applications will be coordinated with the Wyoming State Engineer and the Soil Conservation Service.

## K.6 ACQUISITION

Acquisition of lands will be considered, if in compliance with the Resource Management Plan (RMP), to facilitate various resource management objectives and to acquire lands with high resource values, based on the following criteria (Sec 203 of the FLPMA):

- The preferred method for acquisition will be through exchange.
- Acquisitions of private lands will be pursued only with willing landowners.
- BLM would extend applicable management to acquired lands similar to adjacent or similar BLM managed lands.

## K.7 LANDS SUITABLE FOR DISPOSAL AND ACQUISITIONS

The identification of a public land as having met FLPMA criteria for disposal is NOT, in itself, a decision to dispose of public lands. The process for disposing of public lands via FLPMA Section 203 (Sales), Section 206 (Exchanges), or FLPMA section 212 (R&PP Act) is a lengthy multi-decisional process requiring a comprehensive site-specific analysis, survey, and follow-on decisions prior to a final decision being made by the Department of Interior. There are no official plans to dispose of public lands within the Rock Springs Field Office planning area. Table N-1 lists lands identified for disposal by exchange, sale, or R&PP.

**Table K-1. Lands Identified for Disposal**

Acres	Township	Range	Section	Description
78.71	T. 12 N.	R. 105 W.	15	Lot 7, SE $\frac{1}{4}$ NW $\frac{1}{4}$
130.64	T. 12 N.	R. 111 W.	2	Lots 7-10
305.31	T. 12 N.	R. 111 W.	3	Lots 11-12, S $\frac{1}{2}$ SW $\frac{1}{4}$ , SE $\frac{1}{4}$
17.53	T. 12 N.	R. 111 W.	6	Lots 11, 12, 13
3.61	T. 12 N.	R. 111 W.	7	Lots 16-17

Acres	Township	Range	Section	Description
30.88	T. 12 N.	R. 111 W.	20	Lot 9
25.30	T. 12 N.	R. 111 W.	23	Lot 6
28.54	T. 12 N.	R. 111 W.	26	Lots 1-2
59.92	T. 12 N.	R. 111 W.	27	Lots 1-4
16.22	T. 12 N.	R. 111 W.	28	Lot 4
24.46	T. 12 N.	R. 112 W.	1	Lots 5-7
7.39	T. 12 N.	R. 112 W.	13	Lot 4
18.98	T. 12 N.	R. 112 W.	27	Lot 4
38.44	T. 12 N.	R. 112 W.	28	Lots 1-2
128.00	T. 13 N.	R. 101 W.	18	All or portions of Lots 6, 12, 13, 16 and 17
107.61	T. 13 N.	R. 102 W.	13	Lots 1, 2, 3
600.00	T. 13 N.	R. 111 W.	34	All except SE $\frac{1}{4}$ SE $\frac{1}{4}$
29.61	T. 13 N.	R. 111 W.	35	Lots 1-3
640.00	T. 17 N.	R. 106 W.	12	All
640.00	T. 17 N.	R. 106 W.	14	All
580.14	T. 17 N.	R. 107 W.	4	Lots 7-9, S $\frac{1}{2}$ N $\frac{1}{2}$ , S $\frac{1}{2}$
315.62	T. 17 N.	R. 107 W.	6	Lots 10-14, SW $\frac{1}{4}$ NW $\frac{1}{4}$ , E $\frac{1}{2}$ SW $\frac{1}{4}$
640.00	T. 17 N.	R. 107 W.	8	All
300.00	T. 17 N.	R. 107 W.	10	N $\frac{1}{2}$ SW $\frac{1}{4}$ , E $\frac{1}{2}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ , SE $\frac{1}{4}$ SW $\frac{1}{4}$ , SE $\frac{1}{4}$
640.00	T. 17 N.	R. 107 W.	12	All
640.00	T. 17 N.	R. 107 W.	14	All
637.20	T. 17 N.	R. 107 W.	18	Lots 5-8, E $\frac{1}{2}$ , E $\frac{1}{2}$ W $\frac{1}{2}$
640.00	T. 17 N.	R. 108 W.	12	All
640.00	T. 18 N.	R. 103 W.	4	All
640.00	T. 18 N.	R. 103 W.	6	All
640.00	T. 18 N.	R. 103 W.	8	All
640.00	T. 18 N.	R. 103 W.	16	All
640.00	T. 18 N.	R. 103 W.	20	All
636.40	T. 18 N.	R. 104 W.	2	Lots 5-8, S $\frac{1}{2}$ N $\frac{1}{2}$ , S $\frac{1}{2}$
640.00	T. 18 N.	R. 104 W.	10	All
640.00	T. 18 N.	R. 104 W.	12	All
640.00	T. 18 N.	R. 104 W.	14	All
640.00	T. 18 N.	R. 104 W.	20	All
640.00	T. 18 N.	R. 104 W.	22	All
77.66	T. 18 N.	R. 105 W.	8	Lots 5, 17
317.48	T. 18 N.	R. 105 W.	10	Lots 3-4, 5-6, 11-14
551.69	T. 18 N.	R. 105 W.	18	Lots 5, 7, 8, N $\frac{1}{2}$ NE $\frac{1}{4}$ , NE $\frac{1}{4}$ NW $\frac{1}{4}$ , SE $\frac{1}{4}$ , E $\frac{1}{2}$ SW $\frac{1}{4}$



Acres	Township	Range	Section	Description
345.00	T. 18 N.	R. 105 W.	20	All except acreage sold previously to Solid Waste District #1
640.00	T. 18 N.	R. 105 W.	24	All
320.00	T. 18 N.	R. 105 W.	30	E½
240.00	T. 18 N.	R. 106 W.	14	E½SW¼, SE¼
36.59	T. 18 N.	R. 106 W.	18	Lot 8
640.00	T. 18 N.	R. 106 W.	24	All
232.72	T. 18 N.	R. 107 W.	14	Lots 9-12, 15, 16
455.70	T. 18 N.	R. 107 W.	16	Lots 3-7, 10-15
632.56	T. 18 N.	R. 107 W.	18	Lots 6-8, E½, E½NW¼, E½SW¼.
640.00	T. 18 N.	R. 107 W.	20	All
200.00	T. 18 N.	R. 107 W.	24	S½NW¼NE¼, SW¼NE¼, N½SE¼NE¼, NE¼NE¼, SW¼NW¼, SE¼NW¼
109.98	T. 18 N.	R. 107 W.	26	Lots 9, 10, 16, 18
640.00	T. 18 N.	R. 107 W.	32	All
214.84	T. 18 N.	R. 107 W.	34	Lots 3-4, NW¼, SW¼, S½NW¼ SE¼, S½SE¼
639.92	T. 18 N.	R. 108 W.	2	Lots 5-8, S1/2N1/2, S1/2
640.48	T. 18 N.	R. 108 W.	4	Lots 5-8, S1/2N1/2, S1/2
640.00	T. 18 N.	R. 108 W.	10	All
640.00	T. 18 N.	R. 108 W.	12	All
640.00	T. 18 N.	R. 108 W.	14	All
640.00	T. 18 N.	R. 108 W.	22	All
640.00	T. 18 N.	R. 108 W.	24	All
640.00	T. 18 N.	R. 108 W.	26	All
640.00	T. 18 N.	R. 108 W.	36	All
40.00	T. 19 N.	R. 103 W.	10	NE1/4NW1/4
72.08	T. 19 N.	R. 103 W.	18	Lots 1-2
452.90	T. 19 N.	R. 104 W.	28	Lots 1-2, 7-16
320.00	T. 19 N.	R. 104 W.	34	E½
274.12	T. 19 N.	R. 105 W.	4	Lots 5, 7-12, S½NE¼
20.00	T. 19 N.	R. 105 W.	4	S½NW¼SE¼
167.62	T. 19 N.	R.105 W.	14	Lots 9-10, 16, 31-37
503.83	T. 19 N.	R.105 W.	16	Lots 9-10, 16, 31-37
134.83	T. 19 N.	R.105 W.	28	Lots 3-5, 32-33, 35
411.61	T. 19 N.	R.105 W.	32	Lots, 1-6, 11-14
40.00	T. 19 N.	R. 106 W.	34	SW¼SE¼
627.28	T. 19 N.	R. 107 W.	30	Lots 5-8, E½, E½W½
640.00	T. 19 N.	R. 107 W.	32	All

Acres	Township	Range	Section	Description
80.00	T. 19 N.	R. 107 W.	34	N $\frac{1}{2}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ , N $\frac{1}{2}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ , W $\frac{1}{2}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ , E $\frac{1}{2}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ .
154.54	T. 19 N.	R. 108 W.	6	Lots 8-9, S1/2NE1/4
640.00	T. 19 N.	R. 108 W.	32	All
640.00	T. 20 N.	R.101 W.	2	All
458.32	T. 20 N.	R.101 W.	4	All
640.00	T. 20 N.	R.101 W.	10	All
2.50	T. 20 N.	R.101 W.	28	SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$
29.73	T. 20 N.	R.102 W.	6	Lot 7
80.00	T. 20 N.	R.102 W.	34	SE $\frac{1}{4}$ SW $\frac{1}{4}$ , SW $\frac{1}{4}$ SE $\frac{1}{4}$
320.00	T. 20 N.	R. 105 W.	20	E $\frac{1}{2}$
320.00	T. 20 N.	R. 105 W.	32	E $\frac{1}{2}$
341.54	T. 20 N.	R. 108 W.	6	All
640.00	T. 20 N.	R. 108 W.	8	All
619.64	T. 20 N.	R. 108 W.	18	All
640.00	T. 20 N.	R. 108 W.	20	All
316.90	T. 20 N.	R. 109 W.	2	All
640.00	T. 20 N.	R. 109 W.	10	All
534.84	T. 20 N.	R. 109 W.	12	All
640.00	T. 20 N.	R. 109 W.	14	All
542.98	T. 20 N.	R. 109 W.	24	All
535.28	T. 20 N.	R. 110 W.	6	Lots 1-7, S $\frac{1}{2}$ NE $\frac{1}{4}$ , SE $\frac{1}{4}$ NW $\frac{1}{4}$ , W $\frac{1}{2}$ SW $\frac{1}{4}$ , SE $\frac{1}{4}$
200.00	T. 21 N.	R. 101 W.	22	N $\frac{1}{2}$ NE $\frac{1}{4}$ , N $\frac{1}{2}$ NW $\frac{1}{4}$ , SE $\frac{1}{4}$ NE $\frac{1}{4}$
480.00	T. 21 N.	R. 101 W.	24	All except SW $\frac{1}{4}$
200.00	T. 21 N.	R. 101 W.	26	NE $\frac{1}{4}$ NW $\frac{1}{4}$ , N $\frac{1}{2}$ NE $\frac{1}{4}$ , W $\frac{1}{2}$ SW $\frac{1}{4}$
640.00	T. 21 N.	R. 101 W.	28	All
360.00	T. 21 N.	R. 101 W.	34	N $\frac{1}{2}$ , SE $\frac{1}{4}$ SE $\frac{1}{4}$
320	T. 21 N.	R. 101 W.	36	E $\frac{1}{2}$ NE $\frac{1}{4}$ , E $\frac{1}{2}$ SE $\frac{1}{4}$ , SW $\frac{1}{4}$ SE $\frac{1}{4}$ , S $\frac{1}{2}$ SW $\frac{1}{4}$ , S $\frac{1}{2}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ , S $\frac{1}{2}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ , SW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$
636.78	T. 21 N.	R. 102 W.	34	All
640	T. 21 N.	R. 108 W.	22	All
640	T. 21 N.	R. 108 W.	26	All
640	T. 21 N.	R. 108 W.	28	All
320	T. 21 N.	R. 108 W.	32	E $\frac{1}{2}$
640	T. 21 N.	R. 108 W.	34	All
559.76	T. 24 N.	R. 99 W	8	Lots 1-5, E $\frac{1}{2}$ NE, W $\frac{1}{2}$ NW $\frac{1}{4}$ , NE $\frac{1}{4}$ SE $\frac{1}{4}$ , W $\frac{1}{2}$ SE $\frac{1}{4}$ , SW $\frac{1}{4}$
626.11	T. 24 N.	R. 99 W	9	Lots 1-4, NE $\frac{1}{4}$ , NW $\frac{1}{4}$ , N $\frac{1}{2}$ SE $\frac{1}{4}$ , N $\frac{1}{2}$ SW $\frac{1}{4}$

Acres	Township	Range	Section	Description
86.61	T. 25 N.	R. 106 W.	27	N½NE¼, SW¼ NE¼
640.00	T. 25 N.	R. 112 W.	3	All
640.00	T. 25 N.	R. 112 W.	9	All
640.00	T. 25 N.	R. 112 W.	10	All
640.00	T. 25 N.	R. 112 W.	15	All
80.40	T. 30 N.	R. 108 W.	20	Lots 2, 3
<b>47,982.79</b>	<b>Total Acres for Disposal</b>			
<b>Acquisitions to be Pursued with Willing Parties</b>				
<b>Approximate Acres</b>				
320.00	Sulphur Springs Register			
40.00	Dry Sandy Stage Station			
40.00	LaCledde Stage Station (formerly known as Fort LaCledde)			
40.00	Big Pond Stage Station			
5.00	Point of Rocks Stage Station			
840.00	Additional land along perennial water and wetlands to enhance riparian area management			
1,280	Land within the ½ mile corridor or between river segments on the Big Sandy River			
4,800	Land within the ½ mile corridor or between river segments on the Sweetwater River			
1,920	State inholdings in the Buffalo Hump WSA and Sand Dunes WSA			
1,920	Land on Pine Butte to manage the candidate plant species <i>Descurainia torulosa</i>			

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# APPENDIX L—WILD AND SCENIC RIVER ELIGIBILITY CRITERIA

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## L.1 INTRODUCTION

The following tables display the identification and classification of Bureau of Land Management (BLM)-administered public lands within the Rock Springs Resource Management Plan (RMP) planning area determined to meet the wild and scenic rivers eligibility criteria. Table L-16 provides a summary of the suitability reviews for all stream and river segments considered for wild and scenic river eligibility.

## L.2 LITTLE RED CREEK (PART OF RED CREEK UNIT)

Outstandingly remarkable values of the BLM-administered lands in the waterway review segment include scenic. The red eroded geologic features are remarkable scenic badlands which are unusual in this area. The watershed is relatively untouched and pristine.

**Table L-1. Little Red Creek Segment Review**

Parcel Number*	Waterway Review Segment and Location of Parcel*	Notes/Description/Outstandingly Remarkable Values of Parcel*	Tentative Classification of Waterway Across Parcel*	Length of Waterway Across Parcel* (miles)	Distance to Next BLM Land Parcel (miles)
1	R. 103 W., T. 12 N., Section 18, from border of state land northwest to private land border.	Low riparian; two 2-tracks in waterway corridor; one 2-track crosses creek.	Scenic	0.5	2.0
2	R. 104 W., T. 12 N., Section 12, from border of private land north to border of private land in Section 1.	Low riparian; road parallels entire east bank of creek through BLM-administered parcel and crosses creek; seismic line parallels west bank and crosses creek; 1/4 mile is part of public water reserve.	Recreational	1.0	0.2
3	R. 104 W., T. 12 N., Section 1, from border of private land northwest to border of private land, R. 104 W., T. 13 N., Section 35.	Low riparian; adjacent private lands within waterway corridor; road and two 2-tracks in corridor parallel both banks.	Recreational	0.7	End of waterway segment reviewed.
<b>Total Length of Waterway Segment Reviewed (miles)</b>					<b>4.4</b>
<b>Total Miles Across BLM Lands</b>				<b>2.2</b>	
<b>Percent BLM Jurisdiction of Waterway Segment Reviewed</b>			<b>50%</b>		

\*BLM-Administered Public Land

### L.3 JUNE CREEK (PART OF RED CREEK UNIT)

Outstandingly remarkable values of BLM-administered lands in the waterway review segment include scenic. The red eroded geologic features are remarkable scenic badlands which are unusual in this area. The watershed is relatively untouched and pristine.

**Table L-2. June Creek Segment Review**

<b>Parcel Number*</b>	<b>Waterway Review Segment and Location of Parcel*</b>	<b>Notes/Description/Outstandingly Remarkable Values of Parcel*</b>	<b>Tentative Classification of Waterway Across Parcel*</b>	<b>Length of Waterway Across Parcel* (miles)</b>	<b>Distance to Next BLM Land Parcel (miles)</b>
1	R. 104 W., T. 12 N., Section 9, from border of state land north to junction with Red Creek, R. 104 W., T. 13 N., Section 34.	Low-moderate riparian; 2-track parallels entire west bank of creek; four 2-track crossings of creek.	Recreational	2.6	End of waterway segment reviewed.
<b>Total Length of Waterway Segment Reviewed (miles)</b>					<b>2.6</b>
<b>Total Miles Across BLM Lands</b>				<b>2.6</b>	
<b>Percent BLM Jurisdiction of Waterway Segment Reviewed</b>			<b>100%</b>		

\*BLM-Administered Public Land

## L.4 BEEF STEER CREEK (PART OF RED CREEK UNIT)

Outstandingly remarkable values of BLM-administered lands in the waterway review segment include scenic. The red eroded geologic features are remarkable scenic badlands which are unusual in this area. The watershed is relatively untouched and pristine.

**Table L-3. Beef Steer Creek Segment Review**

<b>Parcel Number*</b>	<b>Waterway Review Segment and Location of Parcel*</b>	<b>Notes/Description/Outstandingly Remarkable Values of Parcel*</b>	<b>Tentative Classification of Waterway Across Parcel*</b>	<b>Length of Waterway Across Parcel* (miles)</b>	<b>Distance to Next BLM Land Parcel (miles)</b>
1	R. 105 W., T. 13 N., Section 12, from headwaters southeast to junction with Red Creek, R. 104 W., T. 13 N., Section 13.	Low-moderate riparian; three seismic crossings; four 2-track access points on west side of creek.	Scenic	4.0	End of waterway segment reviewed.
<b>Total Length of Waterway Segment Reviewed (miles)</b>					<b>4.0</b>
<b>Total Miles Across BLM Lands</b>				<b>4.0</b>	
<b>Percent BLM Jurisdiction of Waterway Segment Reviewed</b>			<b>100%</b>		

\*BLM-Administered Public Land



## L.5 LITTLE RED CREEK (PART OF RED CREEK UNIT)

Outstandingly remarkable values of the BLM-administered lands in the waterway review segment include scenic. The red eroded geologic features are remarkable scenic badlands which are unusual in this area. The watershed is relatively untouched and pristine.

**Table L-4. Little Red Creek Segment Review**

Parcel Number*	Waterway Review Segment and Location of Parcel*	Notes/Description/Outstandingly Remarkable Values of Parcel*	Tentative Classification of Waterway Across Parcel*	Length of Waterway Across Parcel* (miles)	Distance to Next BLM Land Parcel (miles)
1	R. 103 W., T. 12 N., Section 4, from headwaters spring north to border of state land, R. 103 W., T. 13 N., Section 34.	Adjacent state lands within waterway corridor. Low riparian. Heavily timbered in corridor with stock trails cut to creek. Beaver pond stocked with Colorado River cutthroat trout. 2-track in corridor on ridgetop above creek.	Recreational	0.8	0.3
2	R. 103 W., T. 13 N., Section 34, from border of state land northwest to border of state land in Section 33.	Low-moderate riparian. Heavily timbered in corridor. Series of dry historic beaver ponds. Two-track in corridor on ridgetop above creek.	Recreational	0.2	3.0
3	R. 104 W., T. 13 N., Section 36, from border of state land west to border of state land.	Low-moderate riparian; 2-track parallels south bank of creek.	Recreational	0.25	0.4
4	R. 104 W., T. 13 N., Section 35, from border of private land northwest to border of private land, Section 34.	Adjacent low riparian private lands within waterway corridor; 2-track parallels creek on north 0.2 mile.	Scenic	0.3	0.5
5	R. 105 W., T. 12 N., Section 1, from border of private land west to border of state land, Section 31.	Low riparian; two 2-track crossings, two 2-tracks parallel south bank of creek along 20% of distance through BLM-administered parcel; one seismic crossing.	Recreational	3.5	0.8
6	R. 105 W., T. 12 N., Section 1, from border of state land southwest to border of private land Section 15.	Low riparian, no crossings; eight 2-track access points on both sides of creek through BLM-administered parcel.	Scenic	2.6	1.0
7	R. 105 W., T. 12 N., Section 22, from border of private land south to Wyoming-Utah state line and private land border.	Low riparian; road crosses creek and parallels 50% of creek through BLM-administered parcel, ranch ¼ mile SE of lower end of BLM-administered parcel.	Recreational	0.6	End of waterway segment reviewed.
<b>Total Length of Waterway Segment Reviewed (miles)</b>					<b>14.25</b>

Parcel Number*	Waterway Review Segment and Location of Parcel*	Notes/Description/Outstandingly Remarkable Values of Parcel*	Tentative Classification of Waterway Across Parcel*	Length of Waterway Across Parcel* (miles)	Distance to Next BLM Land Parcel (miles)
<b>Total Miles Across BLM Lands</b>				<b>8.25</b>	
<b>Percent BLM Jurisdiction of Waterway Segment Reviewed</b>			<b>58%</b>		

\*BLM-Administered Public Land

## L.6 CURRANT CREEK (PART OF CURRANT CREEK UNIT)

Outstandingly remarkable values of the BLM-administered lands in the waterway review segment include fisheries. There are populations of the Colorado River cutthroat trout in the watershed. This candidate species is a pure strain.

**Table L-5. Currant Creek Segment Review**

Parcel Number*	Waterway Review Segment and Location of Parcel*	Notes/Description/Outstandingly Remarkable Values of Parcel*	Tentative Classification of Waterway Across Parcel*	Length of Waterway Across Parcel* (miles)	Distance to Next BLM Land Parcel (miles)
1	R. 106 W., T. 13 N., Section 1, from border of state land north to border of state land, R. 106 W., T. 14 N., Section 36.	Moderate riparian; no roads in waterway corridor through BLM-administered land; nearest access is 2-track parallel to creek ½ mile west on bench.	Wild	1.2	0.6
2	R. 106 W., T. 14 N., Section 36, from border of state land northwest to border of state land in Section 25.	Moderate riparian; no roads in waterway corridor through BLM-administered land; nearest access is 2-track parallel to creek ½ mile west on bench.	Wild	0.5	0.8
3	R. 106 W., T. 14 N., Section 25, from border of state land northwest to border of state land, Section 24.	Moderate riparian; one 2-track parallels east bank of creek in lower end of BLM-administered parcel; public water reserve covers 80% of creek through BLM-administered land; adjacent state lands within waterway corridor.	Scenic	0.8	1.5

Parcel Number*	Waterway Review Segment and Location of Parcel*	Notes/Description/Outstandingly Remarkable Values of Parcel*	Tentative Classification of Waterway Across Parcel*	Length of Waterway Across Parcel* (miles)	Distance to Next BLM Land Parcel (miles)
4	R. 106 W., T. 14 N., Section 11, from border of state land northwest to border of private land, Section 10.	Moderate to heavy riparian; 2-track parallels 1 ½ miles of creek on north side; ¼ mile of creek through BLM-administered land covered by public water reserve.	Scenic	2.0	1.25
5	R. 106 W., T. 14 N., Section 5, from border of state land west to border of private land, Section 31.	Moderate to heavy riparian; entire creek through BLM-administered land is covered by public water reserve; one two 2-track parallels entire distance through BLM-administered land and crosses once; another 2-track follows opposite side of creek along 50% of distance through BLM-administered land.	Scenic	0.5	2.0
6	R. 107 W., T. 14 N., Section 1, from border of private land northwest to border of private land.	Heavy riparian; 2-track parallels both sides creek; adjacent private lands within waterway corridor at each end (up and downstream) of BLM-administered parcel; ranch approximately ½ mile downstream from BLM-administered parcel.	Scenic	0.5	4.5
7	R. 107 W., T. 15 N., Section 30, from border of private land west to private land border.	Low-moderate riparian; road parallels north bank of creek entire distance through BLM-administered parcel; one 2-track access to creek.	Recreational	0.6	0.2
8	R. 107 W., T. 15 N., Section 30, from border of private land west to border of Flaming Gorge NRA.	Low-moderate riparian; road and 2-track parallel entire distance of creek through BLM-administered parcel on north side.	Recreational	0.2	End of waterway segment reviewed.
<b>Total Length of Waterway Segment Reviewed (miles)</b>					<b>17.15</b>
<b>Total Miles Across BLM Lands</b>				<b>6.3</b>	
<b>Percent BLM Jurisdiction of Waterway Segment Reviewed</b>			<b>37%</b>		

\*BLM-Administered Public Land

## L.7 DRIPPING SPRINGS FORK, CURRANT CREEK (PART OF CURRANT CREEK UNIT)

Outstandingly remarkable values of BLM-administered lands in the waterway review segment include fisheries. There are populations of the Colorado River cutthroat trout in the watershed. This candidate species is a pure strain.

**Table L-6. Dripping Springs Fork, Currant Creek Segment Review**

<b>Parcel Number*</b>	<b>Waterway Review Segment and Location of Parcel*</b>	<b>Notes/Description/Outstandingly Remarkable Values of Parcel*</b>	<b>Tentative Classification of Waterway Across Parcel*</b>	<b>Length of Waterway Across Parcel* (miles)</b>	<b>Distance to Next BLM Land Parcel (miles)</b>
1	R. 105 W., T. 13 N., Section 7, from headwaters north to border of state land, R. 106 W., T. 14 N., Section 36.	Heavy riparian; one powerline crossing; 2-track parallels upstream half (southern) of creek; one-mile of creek across BLM-administered land is covered by public water reserve; adjacent state lands within waterway corridor.	Scenic	2.0	End of waterway segment reviewed.
<b>Total Length of Waterway Segment Reviewed (miles)</b>					<b>2.0</b>
<b>Total Miles Across BLM Lands</b>				<b>2.0</b>	
<b>Percent BLM Jurisdiction of Waterway Segment Reviewed</b>			<b>100%</b>		

\*BLM-Administered Public Land

## L.8 EAST FORK CURRANT CREEK (PART OF CURRANT CREEK UNIT)

Outstandingly remarkable values of BLM-administered lands in the waterway review segment include fisheries. There are populations of the Colorado River cutthroat trout in the watershed. This candidate species is a pure strain.

**Table L-7. East Fork Currant Creek Segment Review**

<b>Parcel Number*</b>	<b>Waterway Review Segment and Location of Parcel*</b>	<b>Notes/Description/Outstandingly Remarkable Values of Parcel*</b>	<b>Tentative Classification of Waterway Across Parcel*</b>	<b>Length of Waterway Across Parcel* (miles)</b>	<b>Distance to Next BLM Land Parcel (miles)</b>
1	R. 105 W., T. 13 N., Section 7, from headwaters north to junction with Currant Creek, R. 106 W., T. 13 N., Section 1.	Moderate-heavy riparian; one powerline crossing; one 2-track parallels west bank of creek.	Scenic	1.0	End of waterway segment reviewed.
<b>Total Length of Waterway Segment Reviewed (miles)</b>					<b>1.0</b>
<b>Total Miles Across BLM Lands</b>				<b>1.0</b>	
<b>Percent BLM Jurisdiction of Waterway Segment Reviewed</b>			<b>100%</b>		

\*BLM-Administered Public Land

## L.9 MIDDLE FORK CURRANT CREEK (PART OF CURRANT CREEK UNIT)

Outstandingly remarkable values of BLM-administered lands in the waterway review segment include fisheries. There are populations of the Colorado River cutthroat trout in the watershed. This candidate species is a pure strain.

**Table L-8. Middle Fork Currant Creek Segment Review**

Parcel Number*	Waterway Review Segment and Location of Parcel*	Notes/Description/Outstandingly Remarkable Values of Parcel*	Tentative Classification of Waterway Across Parcel*	Length of Waterway Across Parcel* (miles)	Distance to Next BLM Land Parcel (miles)
1	R. 105 W., T. 13 N., Section 19, northwest to border of state land, R. 106 W., T. 13 N., Section 12.	Moderate-heavy riparian; one powerline crossing; one 2-track parallels lower 50% in the downstream portion of the west bank of creek.	Scenic	2.0	End of waterway segment reviewed.
<b>Total Length of Waterway Segment Reviewed (miles)</b>					<b>2.0</b>
<b>Total Miles Across BLM Lands</b>				<b>2.0</b>	
<b>Percent BLM Jurisdiction of Waterway Segment Reviewed</b>			<b>100%</b>		

\*BLM-Administered Public Land

## L.10 WEST FORK CURRANT CREEK (PART OF CURRANT CREEK UNIT)

Outstandingly remarkable values of BLM-administered lands in the waterway review segment include fisheries. There are populations of the Colorado River cutthroat trout in the watershed. This candidate species is a pure strain.

**Table L-9. West Fork Currant Creek Segment Review**

Parcel Number*	Waterway Review Segment and Location of Parcel*	Notes/Description/Outstandingly Remarkable Values of Parcel*	Tentative Classification of Waterway Across Parcel*	Length of Waterway Across Parcel* (miles)	Distance to Next BLM Land Parcel (miles)
1	R. 106 W., T. 13 N., Section 14, from border of state land north to border of state land.	Low riparian; one 2-track parallels west bank of creek.	Recreational	0.25	0.3

Parcel Number*	Waterway Review Segment and Location of Parcel*	Notes/Description/Outstandingly Remarkable Values of Parcel*	Tentative Classification of Waterway Across Parcel*	Length of Waterway Across Parcel* (miles)	Distance to Next BLM Land Parcel (miles)
2	R. 106 W., T. 13 N., Section 11, from border of state land north to border of state land.	Low riparian; no roads within corridor through the BLM-administered parcel; nearest access road ½ mile west parallels creek on ridge.	Wild	0.2	0.25
3	R. 106 W., T. 13 N., Section 12, from border of state land north to border of state land.	Low riparian; one 2-track access at lower end of BLM-administered parcel.	Recreational	0.3	End of waterway segment reviewed.
<b>Total Length of Waterway Segment Reviewed (miles)</b>					<b>1.3</b>
<b>Total Miles Across BLM Lands</b>				<b>0.75</b>	
<b>Percent BLM Jurisdiction of Waterway Segment Reviewed</b>			<b>58%</b>		

\*BLM-Administered Public Land

## L.11 PACIFIC CREEK

Outstandingly remarkable values of the BLM-administered lands in the waterway review segment include historic. The Oregon, Mormon Pioneer, California, and Pony Express National Historic Trails parallel much of Pacific Creek. There were many pioneer camping spots along the creek. A Pony Express station was located immediately beside Pacific Springs.

**Table L-10. Pacific Creek Segment Review**

Parcel Number*	Waterway Review Segment and Location of Parcel*	Notes/Description/Outstandingly Remarkable Values of Parcel*	Tentative Classification of Waterway Across Parcel*	Length of Waterway Across Parcel* (miles)	Distance to Next BLM Land Parcel (miles)
1	R. 101 W., T. 27 N., Section 5, from headwaters north to border of private land, R. 102 W., T. 27 N., Section 1.	Low riparian; road/2-track along entire length and right next to creek; historic trail within waterway corridor.	Recreational	3.5	2.0

Parcel Number*	Waterway Review Segment and Location of Parcel*	Notes/Description/Outstandingly Remarkable Values of Parcel*	Tentative Classification of Waterway Across Parcel*	Length of Waterway Across Parcel* (miles)	Distance to Next BLM Land Parcel (miles)
2	R. 102 W., T. 27 N., Section 11, from border of private land southwest to border of private land in Section 21.	Low-moderate riparian; three 2-track crossings; dam/structure in channel, 2-tracks on both sides of creek upstream half (northeast portion) and one on downstream half; other 2-tracks within waterway corridor; historic trail within waterway corridor.	Recreational	4.0	1.0
3	R. 102 W., T. 27 N., Section 29, from border of private land southwest to border of private land.	Moderate-heavy riparian; two 2-tracks within waterway corridor parallel north bank of creek.	Scenic	0.5	0.8
4	R. 102 W., T. 27 N., Section 31, from border of private land southwest to border of private land.	Low riparian; road parallels north bank of creek within waterway corridor.	Scenic	0.2	0.25
5	R. 103 W., T. 26 N., Section 1, from border of state land southwest to border of state land.	Low riparian; two seismic crossings of creek; adjacent state lands within waterway corridor.	Scenic	0.2	0.25
6	R. 103 W., T. 26 N., Section 2, from border of state land southwest to border of state land.	Low riparian; old railroad grade access ½ mile north of creek; no roads within corridor; adjacent state lands within waterway corridor.	Wild	0.3	0.6
7	R. 103 W., T. 26 N., Section 2, from border of state land southwest to border of state land.	Low riparian; railroad grade within waterway corridor; adjacent state lands within waterway corridor.	Scenic	0.1	0.2
8	R. 103 W., T. 26 N., Section 2, from border of state land southwest to border of state land.	Low riparian; one seismic crossing; railroad grade within waterway corridor; adjacent state lands within waterway corridor.	Recreational	0.1	1.0
9	R. 103 W., T. 26 N., Section 10, from border of state land south to border of state land.	Low riparian; railroad grade crosses creek; adjacent state lands within waterway corridor.	Recreational	0.1	0.1
10	R. 103 W., T. 26 N., Section 10, from border of state land southwest to border of state land.	Low riparian; railroad grade within waterway corridor; 2-track crosses creek; one other 2-track to creek; adjacent state lands within waterway corridor.	Recreational	0.2	2.0



Parcel Number*	Waterway Review Segment and Location of Parcel*	Notes/Description/Outstandingly Remarkable Values of Parcel*	Tentative Classification of Waterway Across Parcel*	Length of Waterway Across Parcel* (miles)	Distance to Next BLM Land Parcel (miles)
11	R. 103 W., T. 26 N., Section 17, from border of state land southwest to border of state land.	Low riparian; railroad grade within waterway corridor; two 2-tracks within waterway corridor and one 2-track along creek through BLM-administrated parcel; adjacent state lands within waterway corridor.	Recreational	0.1	1.0
12	R. 103 W., T. 26 N., Section 19, from border of state land southwest to border of state land.	Low riparian; one 2-track within waterway corridor.	Scenic	0.1	0.3
13	R. 103 W., T. 26 N., Section 19, from border of state land southwest to border of state land.	Low riparian; one 2-track within waterway corridor.	Recreational	0.3	0.2
14	R. 103 W., T. 26 N., Section 24, from border of state land southwest to border of state land.	Low riparian; one 2-track parallels north bank of creek.	Recreational	0.1	1.5
15	R. 103 W. T. 26 N., Section 26, from border of state land southwest to border of state land.	Low riparian; railroad grade within waterway corridor; three 2-tracks in corridor (one crosses creek).	Recreational	0.2	0.1
16	R. 103 W., T. 26 N., Section 26, from border of state land southwest to border Bureau of Reclamation lands, R. 105 W., T. 25 N., Section 23.	Low riparian; railroad grade within waterway corridor entire length of creek through BLM-administered parcel; railroad crosses one time, 2-tracks parallel entire creek distance through BLM-administered parcel; two road and three 2-track crossings of the creek.	Recreational	12.0	End of waterway segment reviewed.
<b>Total Length of Waterway Segment Reviewed (miles)</b>					<b>34.05</b>
<b>Total Miles Across BLM Lands</b>				<b>22.0</b>	
<b>Percent BLM Jurisdiction of Waterway Segment Reviewed</b>			<b>65%</b>		

\*BLM-Administered Public Land

## L.12 NORTH FORK OF BEAR CREEK

Outstandingly remarkable values of BLM-administered lands in the waterway review segment include geologic, scenic, recreation, and scientific. The creek flows through the Honeycomb Buttes Wilderness Study Area. The geology of the area is rare and the contrasting colors are scenic. Popular for recreationists and good opportunities for studying high plains desert ecology. The waterway review segment is intermittent.

**Table L-11. North Fork of Bear Creek Segment Review**

<b>Parcel Number*</b>	<b>Waterway Review Segment and Location of Parcel*</b>	<b>Notes/Description/Outstandingly Remarkable Values of Parcel*</b>	<b>Tentative Classification of Waterway Across Parcel*</b>	<b>Length of Waterway Across Parcel* (miles)</b>	<b>Distance to Next BLM Land Parcel (miles)</b>
1	R. 100 W., T. 27 N., Section 1, from headwaters southeast to junction with Bear Creek, R. 98 W., T. 25 N., Section 5.	Very low riparian; one faint 2-track within waterway corridor for approximately one-mile at upstream end, and one 2-track road crosses at downstream end of BLM-administered parcel.	Wild	12.0	End of waterway segment reviewed.
<b>Total Length of Waterway Segment Reviewed (miles)</b>					<b>12.0</b>
<b>Total Miles Across BLM Lands</b>				<b>12.0</b>	
<b>Percent BLM Jurisdiction of Waterway Segment Reviewed</b>			<b>100%</b>		

\*BLM-Administered Public Land

## L.13 CANYON CREEK

Outstandingly remarkable values of the BLM-administered lands in the waterway review segment include scenic and historic. The creek has steep sloped bordering the toe slopes of Pine Mountain giving scenic contrasting views of geology and vegetation. The creek is along the route used by Western outlaws to reach hideouts in Brown's Park, in Colorado. The creek is also adjacent to the diamond fields of the Great Diamond "Hoax" at the base of Diamond Peak, just south of the Wyoming state line.

**Table L-12. Canyon Creek Segment Review**

Parcel Number*	Waterway Review Segment and Location of Parcel*	Notes/Description/Outstandingly Remarkable Values of Parcel*	Tentative Classification of Waterway Across Parcel*	Length of Waterway Across Parcel* (miles)	Distance to Next BLM Land Parcel (miles)
1	R. 103 W., T. 12 N., Section 22, from headwaters northeast to border of private land, Section 24.	Low-moderate riparian; road and 2-track parallel 50% of creek distance through BLM-administered parcel; three seismic crossings; adjacent state lands within corridor at upstream end of BLM-administered parcel; adjacent private lands within corridor at downstream end of BLM-administered parcel	Recreational	1.3	0.7
2	R. 102 W., T. 12 N., Section 18, from border of private land northeast to border of private land.	Low riparian; two 2-tracks to creek; road parallels south side of creek (within ¼ mile) through BLM-administered parcel.	Recreational	0.25	0.5
3	R. 102 W., T. 12 N., Section 18, from border of private land northeast to border of state land.	Low riparian; 2-track parallels creek on south side.	Recreational	0.2	1.0
4	R. 102 W., T. 12 N., Section 17, from border of state land southeast to border of private land, Section 16 (SE corner).	Low riparian; road parallels north side of creek through BLM-administered parcel; one old irrigation diversion; two roads and three seismic crossings.	Recreational	1.1	1.0
5	R. 102 W., T. 12 N., Section 23, from border of private land east to border of private land.	Low-moderate riparian; road parallels north side of creek through BLM-administered parcel; one new irrigation diversion.	Recreational	1.1	0.7
6	R. 102 W., T. 12 N., Section 13, from border of private land east to border of private land, R. 101 W., T. 12 N., Section 18.	Moderate riparian; road crosses creek and parallels north side of creek through BLM-administered parcel.	Recreational	0.6	1.6

<b>Parcel Number*</b>	<b>Waterway Review Segment and Location of Parcel*</b>	<b>Notes/Description/Outstandingly Remarkable Values of Parcel*</b>	<b>Tentative Classification of Waterway Across Parcel*</b>	<b>Length of Waterway Across Parcel* (miles)</b>	<b>Distance to Next BLM Land Parcel (miles)</b>
7	R. 101 W., T. 12 N., Section 20, from border of state land southeast to border of private land.	Moderate riparian; bench road parallels north side of creek (1/8 mile from creek) through BLM-administered parcel.	Recreational	0.1	0.6
8	R. 101 W., T. 12 N., Section 21 from border of private land southeast to Wyoming-Colorado state line.	Moderate-heavy riparian; no roads in waterway corridor; nearest access 2-track to creek at upstream end of BLM-administered parcel.	Wild	0.4	End of waterway segment reviewed
<b>Total Length of Waterway Segment Reviewed (miles)</b>					<b>11.15</b>
<b>Total Miles Across BLM Lands</b>				<b>5.05</b>	
<b>Percent BLM Jurisdiction of Waterway Segment Reviewed</b>			<b>45%</b>		

\*BLM-Administered Public Land

## L.14 SWEETWATER RIVER

Outstandingly remarkable values of the BLM-administered lands in the waterway review segment include scenic, historic, and recreational. The river played a major role in the Oregon, Mormon Pioneer, California, and Pony Express National Historic Trails. It was crossed nine times by the trails. The rugged Sweetwater Canyon is only accessible by foot. Campsites along the river are very popular recreation areas.

**Table L-13. Sweetwater River Segment Review**

Parcel Number*	Waterway Review Segment and Location of Parcel*	Notes/Description/Outstandingly Remarkable Values of Parcel*	Tentative Classification of Waterway Across Parcel*	Length of Waterway Across Parcel* (miles)	Distance to Next BLM Land Parcel (miles)
1	R. 102 W., T. 30 N., Section 19, from Bridger Forest border south to beginning of Sweetwater Canyon, Section 19.	Heavy riparian; one road leading to Guard Station Campground and network of roads in the campground. Recreational usage.	Recreational	0.6	0
2	R. 102 W., T. 30 N., Section 19, from beginning of Sweetwater Canyon to Sweetwater Campground.	No access to canyon other than by foot; three 2- tracks to rim of canyon from west; road access to Sweetwater Campground at southern end of BLM-administered parcel.	Wild	3.0	0
3	R. 102 W., T. 29 N., Section 5, from Sweetwater Campground southeast to border of state lands, Section 16.	Heavy riparian; road access into BLM-administered parcel and road parallels 0.1 mile of the river within this parcel.	Recreational	2.8	3.0
4	R. 102 W., T. 29 N., Section 27, from border of private land southeast to border of state land.	Heavy riparian; nearest access 2-track ½ mile south of BLM-administered parcel; no roads in corridor.	Wild	0.6	0.5
5	R. 102 W., T. 29 N., Section 34, from border of state land south to border of private land.	Heavy riparian; 2-track parallels west bank; one 2-track access from east; two 2-tracks access from west.	Scenic	0.5	0.25
6	R. 102 W., T. 28 N., Section 4, from border of state land south to border of private land.	Heavy riparian; no roads in corridor; nearest access is 2-track ¼ mile above north end of BLM-administered parcel.	Wild	1.0	0.2
7	R. 102 W., T. 28 N., Section 10, from border of private land southeast to border of private land Section 11.	Heavy riparian; no roads in corridor; nearest access is parallel road ¾ mile east of river.	Wild	1.2	3.2

<b>Parcel Number*</b>	<b>Waterway Review Segment and Location of Parcel*</b>	<b>Notes/Description/Outstandingly Remarkable Values of Parcel*</b>	<b>Tentative Classification of Waterway Across Parcel*</b>	<b>Length of Waterway Across Parcel* (miles)</b>	<b>Distance to Next BLM Land Parcel (miles)</b>
8	R. 101 W., T. 28 N., Section 19, from border of private land southeast to border of private land.	Heavy riparian; two 2-tracks in corridor, adjacent private lands within corridor.	Scenic	0.6	8.5
9	R. 100 W., T. 28 N., Section 29, from border of state land northeast to border of private land Section 27.	Moderate-heavy riparian; two 2-tracks in corridor each side of river.	Scenic	2.5	0.3
10	R. 100 W., T. 28 N., Section 29, from border of state land northeast to border of private land Section 26.	Heavy riparian; diversion and irrigation ditch along north bank of river; two 2-tracks in corridor; adjacent private lands within corridor.	Recreational	0.3	End of waterway segment reviewed.
<b>Total Length of Waterway Segment Reviewed (miles)</b>					<b>29.05</b>
<b>Total Miles Across BLM Lands</b>				<b>13.1</b>	
<b>Percent BLM Jurisdiction of Waterway Segment Reviewed</b>			<b>45%</b>		

\*BLM-Administered Public Land

## L.15 BIG SANDY RIVER

Outstandingly remarkable values of the BLM-administered lands in the waterway review segment include historic. The river played a major role in the Oregon, Mormon Pioneer, California, and Pony Express National Historic Trails as a major campsite. Jedediah Smith's party which discovered South Pass traveling east to west, crossed the upper reaches of the river.

**Table L-14. Big Sandy River Segment Review**

Parcel Number*	Waterway Review Segment and Location of Parcel*	Notes/Description/Outstandingly Remarkable Values of Parcel*	Tentative Classification of Waterway Across Parcel*	Length of Waterway Across Parcel* (miles)	Distance to Next BLM Land Parcel (miles)
1	R. 100 W., T. 27 N., Section 1, from Section 5.	Heavy riparian; one faint 2-track to river at north end of BLM-administered parcel.	Wild	1.5	2.0
There are a total of 36 BLM-administered land parcels along the 74.6-mile review segment of the Big Sandy River. The 36 BLM-administered parcels represent a total of 16.15 miles of the review segment. Only the one parcel, involving 1.5 miles of the waterway, was determined to meet the WSR eligibility criteria.				-	-
<b>Total Length of Waterway Segment Reviewed (miles)</b>					<b>74.6</b>
<b>Total Miles Across BLM Lands</b>				<b>16.15</b>	
<b>Percent BLM Jurisdiction of Waterway Segment Reviewed</b>			<b>22%</b>		

\*BLM-Administered Public Land

## L.16 GREEN RIVER

Outstandingly remarkable values of the BLM-administered lands in the waterway review segment include wildlife, historic, and recreational. The river played a major role in the Oregon, Mormon Pioneer, California, and Pony Express National Historic Trails as it was one of the most dangerous crossings along the trails. Wildlife populations along the Green River are extensive and varied. The river is popular for floating, fishing, camping, and retracing historic expeditions.

**Table L-15. Green River Segment Review**

Parcel Number*	Waterway Review Segment and Location of Parcel*	Notes/Description/Outstandingly Remarkable Values of Parcel*	Tentative Classification of Waterway Across Parcel*	Length of Waterway Across Parcel* (miles)	Distance to Next BLM Land Parcel (miles)
1	R. 112 W., T. 28 N., Section 24, from border of private land southeast and west (loop) to border of private land.	Heavy riparian; cottonwood bottom; 2-track access on west bank of river.	Scenic	0.25	1.2
2	R. 112 W., T. 28 N., Section 24, from border of private land southeast to border of private land.	Heavy riparian; cottonwood bottom; two old channels and sandbars; 2-track parallels east side; one 2-track to bottom adjacent state lands within corridor.	Recreational	0.4	6.0
3	R. 112 W., T. 27 N., Section 20, from border of private land southwest to border of private land, Section 29.	Moderate riparian; U.S. 179 within corridor west of BLM-administered parcel; one parallel 2-track between highway and river.	Recreational	0.4	0.25
4	R. 112 W., T. 27 N., Section 31, from border of private land south to border of private land.	Moderate riparian; two 2-tracks, one on each side of river through BLM-administered parcel.	Recreational	0.25	1.2
5	R. 112 W., T. 27 N., Section 31, from border of private land south to border of private land.	Moderate riparian; U.S. 189 within corridor; adjacent private lands within corridor; bridge crosses river; BLM-administered parcel approximately ½ mile north of LaBarge.	Recreational	0.3	6.0
6	R. 112 W., T. 26 N., Section 33, from border of private land southwest to border of private land and Bureau of Reclamation land forks.	Moderate-heavy riparian; river splits around island; adjacent private lands within corridor; roads and 2-tracks parallel both banks.	Recreational	0.25	56.0



Parcel Number*	Waterway Review Segment and Location of Parcel*	Notes/Description/Outstandingly Remarkable Values of Parcel*	Tentative Classification of Waterway Across Parcel*	Length of Waterway Across Parcel* (miles)	Distance to Next BLM Land Parcel (miles)
7	R. 112 W., T. 18 N., Section 6, from border of private land southeast to border of private land.	Moderate riparian; adjacent private lands within corridor; I-80 crosses river approximately 100 yards below BLM-administered parcel; 2-track access to river south side.	Recreational	0.1	2.0
8	R. 107 W., T. 18 N., Section 8, from border of private land southeast to border of private land.	Low-moderate riparian; adjacent private lands, Union Pacific railroad, and Rio Vista subdivision within corridor.	Recreational	0.5	0.9
9	R. 107 W., T. 12 N., Section 16, from border of private land southeast to border of private land.	Low riparian; I-80 within corridor, pipeline or powerline crosses river; 2-track to river both sides.	Recreational	0.4	End of waterway segment reviewed.
<b>Total Length of Waterway Segment Reviewed (miles)</b>					<b>71.0</b>
<b>Total Miles Across BLM Lands</b>				<b>2.85</b>	
<b>Percent BLM Jurisdiction of Waterway Segment Reviewed</b>			<b>4%</b>		

\*BLM-Administered Public Land

## **L.17 RESULTS OF THE WILD AND SCENIC RIVERS SUITABILITY REVIEW OF BUREAU OF LAND MANAGEMENT-ADMINISTERED PUBLIC LANDS ALONG WATERWAYS IN THE ROCK SPRINGS RESOURCE MANAGEMENT PLAN PLANNING AREA**

### **L.17.1 Red Creek (includes Little Red Creek, June Creek, and Beef Steer Creek)**

It was determined that the 12 BLM-administered public land parcels along the Red Creek Unit review segments (including Little Red Creek, June Creek, and Beef Steer Creek) do not meet the wild and scenic river suitability factors and will be given no further consideration for inclusion in the wild and scenic river system. The non-suitable determination is based on (1) the potential conflicts with management and activities conducted on the adjacent (and up or downstream) state and private lands that the BLM has no jurisdiction or control over, (2) the inability of the BLM to manage the BLM-administered public lands involved in the context of a wild and scenic river because of the interspersed parcels of private and state land, and (3) the BLM-administered public lands do not constitute a worthy addition to the National Wild and Scenic River System. The land and resource values on the BLM-administered lands involved can and will continue to be appropriately managed under all other applicable BLM mandates and regulations for multiple use, sustained yield, and environmental integrity, and should suffer no adverse effects for lack of a wild and scenic river designation.

### **L.17.2 Currant Creek (includes Dripping Springs, East, Middle, and West Forks)**

It was determined that the 14 BLM-administered public land parcels along the Currant Creek Unit review segments (including Dripping Springs, East, Middle, and West Forks) do not meet the wild and scenic river suitability factors and will be given no further consideration for inclusion in the wild and scenic river system. The non-suitable determination is based on (1) the potential conflicts with management and activities conducted on the adjacent (and up or downstream) state and private lands that the BLM has no jurisdiction or control over, and (2) the inability of the BLM to manage the BLM-administered public lands involved in the context of a wild and scenic river because of the interspersed parcels of private and state land. The land and resource values on the BLM-administered lands involved can and will continue to be appropriately managed under all other applicable BLM mandates and regulations for multiple use, sustained yield, and environmental integrity, and should suffer no adverse effects for lack of a wild and scenic river designation.

### **L.17.3 Pacific Creek**

It was determined that the 16 BLM-administered public land parcels along the Pacific Creek review segment do not meet the wild and scenic river suitability factors and will be given no further consideration for inclusion in the wild and scenic river system. The non-suitable determination is based on (1) the potential conflicts with management and activities conducted on the adjacent (and up or downstream) state and private lands that the BLM has no jurisdiction or control over, and (2) the inability of the BLM to manage the BLM-administered public lands involved in the context of a wild and scenic river because of the interspersed parcels of private and state land. The land and resource values on the BLM-administered lands involved can and will continue to be appropriately managed under all other applicable BLM mandates and regulations for multiple use, sustained yield, and environmental integrity, and should suffer no adverse effects for lack of a wild and scenic river designation.

### **L.17.4 North Fork of Bear Creek**

It was determined that the BLM-administered public land parcel along the North Fork of Bear Creek review segment does not meet the wild and scenic river suitability factors and will be given no further consideration for inclusion in the wild and scenic river system. The non-suitable determination is based on (1) the BLM-administered lands involved do not constitute a worthy addition to the National Wild and Scenic River System, and (2) the lack of public, state, local, tribal, or federal interest in designation or non-designation of any part or all of the creek. The land and resource values on the BLM-administered lands involved can and will continue to be appropriately managed under all other applicable BLM mandates and regulations for multiple use, sustained yield, and environmental integrity, and should suffer no adverse effects for lack of a wild and scenic river designation.

### **L.17.5 Canyon Creek**

It was determined that the eight BLM-administered public land parcels along the Canyon Creek review segment do not meet the wild and scenic river suitability factors and will be given no further consideration for inclusion in the wild and scenic river system. The non-suitable determination is based on (1) the potential conflicts with management and activities conducted on the adjacent (and up or downstream) state and private lands that the BLM has no jurisdiction or control over, (2) potential use conflicts with Canyon Creek which could occur if it is included in the National Wild and Scenic River System, and (3) the inability of the BLM to manage the BLM-administered public lands involved in the context of a wild and scenic river because of the interspersed parcels of private and state land. The land and resource values on the BLM-administered lands involved can and will continue to be appropriately managed under all other applicable BLM mandates and regulations for multiple use, sustained yield, and environmental integrity, and should suffer no adverse effects for lack of a wild and scenic river designation.

### **L.17.6 Sweetwater River**

It was determined that seven of the BLM-administered public land parcels along the upstream portion of the Sweetwater River review segment meet the wild and scenic river suitability factors and should be managed to maintain or enhance their outstandingly remarkable values for any possible future consideration for inclusion in the wild and scenic river system. The suitable determination is based on the uniqueness of the diverse BLM-administered land resources and their regional and national significance, making them worthy of any future consideration for addition to the wild and scenic river system.

The outstanding scenic, historic, and recreational values associated with the BLM-administered lands involved make this a uniquely diverse waterway segment in the region. Within this portion of the review segment, the Sweetwater Canyon and recreational opportunities at the Sweetwater campgrounds are of particularly high value.

Making up over 70% of the lands along this portion of the review segment, the BLM-administered public lands are manageable by the BLM as a wild and scenic river under the provisions of the Wild and Scenic River Act. Other factors that complement and enhance this manageability include (1) the existing public access to existing recreational areas in the review segment, and (2) there are no anticipated conflicts with the management objectives on the intermingled state and private lands within the review segment and the intermingled private lands are not large or extensive parcels as with ownership patterns along other waterways in the RMP planning area.

It was determined that the remaining three BLM-administered public land parcels within the downstream portion of the Sweetwater River review segment do not meet the wild and scenic river suitability factors

and will be given no further consideration for inclusion in the wild and scenic river system. The non-suitable determination for these three parcels is based on (1) the potential conflicts with management and activities conducted on the adjacent (and up or downstream) state and private lands that the BLM has no jurisdiction or control over. The land and resource values on the BLM-administered lands involved can and will continue to be appropriately managed under all other applicable BLM mandates and regulations for multiple use, sustained yield, and environmental integrity, and should suffer no adverse effects for lack of a wild and scenic river designation.

### L.17.7 Big Sandy River

It was determined that the one BLM-administered public land parcel along the Big Sandy River review segment does not meet the wild and scenic river suitability factors and will be given no further consideration for inclusion in the wild and scenic river system. The non-suitable determination is based on the inability of the BLM to manage the small amount of BLM-administered public lands involved in the context of a wild and scenic river. The land and resource values on the BLM-administered lands involved can and will continue to be appropriately managed under all other applicable BLM mandates and regulations for multiple use, sustained yield, and environmental integrity, and should suffer no adverse effects for lack of a wild and scenic river designation.

### L.17.8 Green River

It was determined that the nine BLM-administered public land parcels along the Green River review segment do not meet the wild and scenic river suitability factors and will be given no further consideration for inclusion in the wild and scenic river system. The non-suitable determination is based on (1) the potential conflicts with management and activities conducted on the adjacent (and up or downstream) state and private lands that the BLM has no jurisdiction or control over, and (2) the inability of the BLM to manage the BLM-administered public lands involved in the context of a wild and scenic river because of the interspersed parcels of private and state land. The land and resource values on the BLM-administered lands involved can and will continue to be appropriately managed under all other applicable BLM mandates and regulations for multiple use, sustained yield, and environmental integrity, and should suffer no adverse effects for lack of a wild and scenic river designation. The BLM administers only a minute amount of land (4%) along the 71 miles of the Green River flowing through the Green River Resource Area. However, other Department of the Interior agencies (Bureau of Reclamation [BOR] and U.S. Fish and Wildlife Service [USFWS]) manage a large part of the remaining lands along the river. In addition, there was quite a bit of public interest for designation of the Green River as a Recreational River. The BLM would participate in any future joint study efforts or wild and scenic river reviews along the Green River.

**Table L-16. Summary of Wild and Scenic River Suitability Review**

<b>Waterway Reviewed</b>	<b>Determination</b>	<b>Justification</b>
Red Creek Unit (all BLM land parcels along Red Creek and all other tributaries in the unit) <sup>2</sup>	BLM Lands Not Suitable	Not a worthy addition to the Wild and Scenic River System; land ownership conflicts; manageability.
Currant Creek Unit (all BLM land parcels along Currant Creek and all other tributaries in the unit) <sup>2</sup>	BLM Lands Not Suitable	Land ownership conflicts; manageability.
Pacific Creek <sup>2</sup>	BLM Lands Not Suitable	Land ownership conflicts; manageability.
North Fork of Bear Creek <sup>2</sup>	BLM Lands Not Suitable	Not a worthy addition to the Wild and Scenic River System; lack of interest for designation.

<b>Waterway Reviewed</b>	<b>Determination</b>	<b>Justification</b>
Canyon Creek <sup>2</sup>	BLM Lands Not Suitable	Potential use conflicts; manageability.
Green River <sup>1</sup>	BLM Lands Not Suitable	Manageability; land ownership conflicts.
Sweetwater River (upstream portion of review segment) <sup>2</sup>	7 BLM Land Parcels Suitable	Scenic, historic, and recreational values, unique land and resource diversity.
Sweetwater River (downstream portion of review segment) <sup>2</sup>	3 BLM Land Parcels Not Suitable	Land ownership conflicts.
Big Sandy River <sup>2</sup>	BLM Lands Not Suitable	Manageability.

<sup>1</sup>Green River - The portion of the Green River administered by the BLM did not meet the suitability factors based upon the inability of the BLM to manage the BLM-administered lands in the context of a wild and scenic river because of the large and numerous separations of the few BLM administered parcels by interspersed private and state lands and by other federal lands administered by the BOR and USFWS. However, the BLM would participate in any future joint WSR reviews or studies that may be conducted on the Green River.

<sup>2</sup>The BLM would participate in any future study, or joint efforts, or wild and scenic river reviews (re-evaluation) along streams and waterways for potential WSR designation within the planning area.

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# **APPENDIX M—ASPEN MOUNTAIN COMMUNICATIONS SITE MANAGEMENT PLAN**

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Department of the  
Interior  
Bureau of Land Management



# ASPEN MOUNTAIN COMMUNICATIONS SITE MANAGEMENT PLAN

Prepared by the Bureau of Land Management  
Rock Springs Field Office, Wyoming

Approved by: \_\_\_\_\_  
Field Manager

\_\_\_\_\_ Date



Department of the  
Interior  
Bureau of Land Management



## ASPEN MOUNTAIN COMMUNICATIONS SITE MANAGEMENT PLAN

Prepared by the Bureau of Land Management  
Rock Springs Field Office, Wyoming

Approved by: *Sam C. Foster*  
Field Manager

1 Sept. 2011  
Date



## ASPEN MOUNTAIN COMMUNICATIONS SITE MANAGEMENT PLAN

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## **I. INTRODUCTION**

Demand for new communication sites continues to be active in the United States including carrier requests to locate cellular facilities on public lands in the western states. This demand is due to advances in communication technology, strong consumer interest, and a 1983 Federal Communication Commission (FCC) decree establishing wireless carrier coverage requirements.

Aspen Mountain is an established communication site with characteristics desired by wireless carriers, TV and radio stations, and other communication providers. The communication site overlooks a rural but growing population area of the city of Rock Springs to the north. Interstate Highway 80 runs in a generally west/east direction through the area about 12 miles north of Aspen Mountain. A number of State Highways and other secondary roads also run through the surrounding area.

This Communication Site Management Plan has been developed to document and evaluate the existing communication site and facilities located on Aspen Mountain. The plan also provides an outline for orderly future development of the site in conformance with the Rock Springs Field Office's (RSFO) current land use planning document, the Green River Resource Management Plan (RMP).

Current BLM program guidance for resource management planning specifies that every planning document shall contain determinations relevant to communication sites. The Green River RMP, Record of Decision signed August 8, 1997, does not discuss specific details needed for proper management of the communication site. Therefore, in order to supplement the land use planning document, this site management plan has been prepared to address specific issues encountered on Aspen Mountain.

Approved lessees or right-of-way (ROW) holders with facilities currently located on Aspen Mountain are shown in the Users' Table, Appendix B. Additional tenants or customers may be accommodated within the confines of existing authorized communication facilities as long as such additions are in compliance with the terms and conditions of authorized leases or ROW grants and with the supplemental direction contained in this site plan. Requests for new communication site facilities may be authorized at the discretion of BLM's Authorized Officer (AO) through the issuance of new Communications Use Leases, or in some cases, by the issuance of additional ROW grants.

This site plan will be incorporated into all future new leases issued for the Aspen Mountain Communication Site. This plan will also be included as a part of all existing leases and renewed leases or ROW grants as the terms of those authorizations allow. Provisions of the site plan are enforced through the terms and conditions of the ROW or lease authorization. Each lessee is expected to incorporate mandatory BLM lease and site plan requirements into any subsequent agreements with the lessee's tenants and customers. The lessee is also responsible for enforcement of said requirements involving the lessee's tenants and customers.

## **A. Terms and Definitions**

The terms used in this Communications Site Management Plan conform to the definitions listed in the April 22, 2005, Federal Register notice “Rights-of-Way, Principles and Procedures: Rights-of-Way under the Federal Land Policy and Management Act and the Mineral Leasing Act”, with further clarification provided in Bureau of Land Management (BLM) Handbook 2860-1 and the United States Code of Federal Regulations (CFR) 43 CFR 2800. In the event of a conflict, between the plan and these sources, the Federal Register notice and the BLM Handbook will govern.

The words “lease” and “lessee” as used in this plan refer to the relationship between the BLM and the communications use lease lessee, or ROW holder. The words “customer” and “tenant” refer to the relationship between the lessee or holder and the occupants in the lessee’s facilities.

**LEASE OR ROW** – A use authorization issued to a communication Facility Owner or Facility Manager allowing for the use of public land to construct and or operate a communications facility and, unless specifically prohibited, to sublease to occupants in that facility.

**LESSEE, LEASE HOLDER, OR ROW HOLDER** – A Facility Owner or Facility Manager.

**CUSTOMER** – A facility occupant who is paying a facility manager, facility owner, or tenant for using all or any part of the space in the facility, or for communication services, and is not selling communication services or broadcasting to others.

**TENANT** – A facility occupant who is paying a facility manager, facility owner, or other entity for occupying and using all or part of a facility. A tenant operates communication equipment in the facility for profit by broadcasting to others or selling communication services.

**COMMUNICATIONS SITE** – An area of BLM-managed public land designated through the land and resource management planning process as being used or is suitable for communications uses. A communications site may be limited to a single communications facility, but most often encompasses more than one. Each site is identified by name; usually a local prominent landmark, such as Aspen Mountain Communications Site.

**FACILITY** – The building, tower, and related incidental structures or improvements authorized under the terms of the grant or lease.

**FACILITY MANAGER** – The holder of a BLM communications use authorization who leases space for other communication users. A facility manager does not own or operate communications equipment in the facility for personal or commercial purposes.

**FACILITY OWNER** – Individuals, commercial entities, organizations, or agencies, that own a communications facility on Federal land; own and operate their own communications equipment; and hold a communications use authorization. Facility owners may or may not lease space in the facility to other communications users.

NON-BROADCAST – This category includes Commercial Mobile Radio Service, Facility Managers, Cellular Telephone, Private Mobile Radio Service (PMRS), Microwave, Local Exchange Network, and Passive Reflector.

BROADCAST – This category includes Television Broadcast, AM and FM Radio Broadcast, Cable Television, Broadcast Translator, Low Power Television, and Low Power FM Radio.

RIGHT-OF-WAY (ROW) – The public land authorized to be used or occupied pursuant to a ROW grant.

RIGHT-OF-WAY GRANT – A use authorization issued pursuant to Title V of the Federal Land Policy and Management Act of October 21, 1976 (43 U.S.C. 1701 *et seq.*) or issued on or before October 21, 1976, pursuant to then existing statutory authority, authorizing the use of a ROW over, upon, under or through public land for construction, operation, maintenance and termination of a project.

HOLDER – Any applicant who has received a ROW grant, lease or temporary use permit.

USERS – All ROW and lease holders, lessees, customers, and tenants that own or operate a facility or communication equipment at the communication site.

SENIOR USE – Any use whose implementation date is prior to the implementation date of the use in question.

RANALLY METRO AREA (RMA) – A series of nine population zone areas, the highest of which is greater than 5 million and the lowest being 25,000 or less. These zones are determined annually and published in the Ranally Metro Area Population Ranking, an independent publication from Rand McNally, and are used in rent determination under guidelines established in 43 CFR 2806.

## **B. Purpose**

This plan will be used by BLM officials administering communications uses at Aspen Mountain, existing lessees, holders, and applicants desiring a lease, grant, or an amendment to an existing lease or ROW grant. The plan will be kept updated by amending pages or sections of the plan rather than issuing a revised edition of the plan. When an administrative revision is necessary (such as the addition of a user), a letter will be sent to the holders from the RSFO enclosing a copy of revised pages or sections. The amendments will be consecutively numbered. Other proposed revisions to the plan will be circulated to holders for comment prior to implementation.

Overall management direction for the administration of communications sites is outlined in the CFR and the BLM Handbook and applicable BLM Instructional Memoranda. Specific direction for site management planning on designated communications sites is contained in BLM Handbook 2860-1. Primary regulations and policy pertaining to issuance of ROW authorizations by the BLM are found in Title 43 CFR Sections 2801- 2808 and BLM Handbook 2860-1.

This Site Management Plan provides applicable guidance and adds current policy and technical standards for better management of the Aspen Mountain Communications Site. This plan

governs development and management of Aspen Mountain and will be modified in the future as needs and conditions warrant. Any future such uses must be designed, installed, operated, and maintained to be compatible and not interfere with the senior uses as defined in Section A above. This site-specific plan is administrative in nature and is Categorically Excluded from further review under the National Environmental Policy Act (NEPA) in accordance with 516.DM 2, Appendix 1, item 1.10, which states “ – Policies, directives, regulations, and guidelines that are of an administrative, financial, legal, technical, or procedural in nature and whose environmental effects are too broad, speculative, or conjectural to lend themselves to meaningful analysis and will later be subject to the NEPA process, either collectively or case-by-case”. Any additional development of Aspen Mountain will be addressed in a site-specific NEPA document.

### **C. Site Description**

The site is located approximately 12 miles south of Rock Springs, Wyoming and approximately 9.5 miles east of US Highway 191. It is on Aspen Mountain, a prominent landmark in the area. The area is managed by the RSFO. It is specifically located in the SE<sup>1</sup>/<sub>4</sub>SE<sup>1</sup>/<sub>4</sub> of sec. 22, T. 17 N., R. 104 W., 6<sup>th</sup> Principal Meridian, Sweetwater County, Wyoming at approximately 41° 25’ 50.7” North Latitude and 109° 07’ 15.6” West Longitude. The elevation at the Aspen Mountain Communications Site is approximately 7,858 feet above mean sea level. A site map is provided as Appendix A.

### **D. Area Served**

This site does not serve an RMA. The largest population zone served is less than 25,000. This zone may be adjusted in the future as populations change. This information will be used for rental fee determination.

### **E. Access**

From US Highway 430, travel south on County Road 4-27 approximately 7.5 miles to Radio Telephone Road. Turn left (east) and travel approximately 2.2 miles to Aspen Mountain.

### **F. Site History and Development**

There are currently five communications facilities at Aspen Mountain. On July 8, 1975 the first communications facility was granted to the BLM under serial number WYW 52096.

Colorado Interstate Gas Co. was the second entity to construct a facility granted under authorization WYW 53936 on January 21, 1977 for their internal communications.

The Qwest Corporation was authorized to construct their facilities on September 15, 1988 to include microwave under ROW grant WYW107566.

The fourth entity issued a communication site ROW (WYW105090) was Ted Higgins on May 24, 1991. The ROW was assigned to Communications Technologies Inc, the current holder.

The last user issued a ROW (WYW167451) was to Sterling Communications in July 25, 2008. Previously, the Industrial Communications was the previous holder until their ROW was terminated on October 3, 2005.

A list of all authorized facilities as of the date of this plan can be found in Appendix B. Any modifications to existing facilities or proposals for new facilities must be approved by the RSFO according to the appropriate NEPA process and guidance described in this document.

The site currently appears to be relatively clean from interference, receiver sensitivity, and noise. If additional new uses deteriorate the receiving/transmitting operation of the existing uses, the new uses may be required to institute additional studies, equipment upgrades, frequency isolation, or physically separate from the existing uses. This may be particularly required if they are continuously transmitting in nature, or if there is an increase in transmitter power from communications uses on private land.

### **G. Goals and Objectives of the Site Management Plan**

1. Manage the Aspen Mountain site for low-power uses including two-way radio, microwave, cellular, cable television reception, in addition to high power uses such as radio broadcast. All uses must be designed, operated and maintained so as not to physically or electronically interfere with the senior uses.
2. Manage communication equipment on the Aspen Mountain site to maintain the radio frequency radiation (RFR) to be within the Public Standard as defined by the FCC.
3. Systematically develop the site to maximize the number of compatible uses while ensuring safety and protection of resources. Development of new towers or buildings within each of the authorized owner's facilities will be authorized only after their respective tower or building space area is filled to near capacity.
4. Help fulfill the public need for adequate communications sites.
5. Protect the interests of holders, lessees, tenants and customers, by preserving a safe and electronically "clean" environment.
6. Encourage the efficient development and use of space and facilities within the designated site.
7. Achieve visual quality objectives by requiring design standards that are unobtrusive and utilizing earth tone colors and non-reflective surface material and stringent site maintenance requirements.
8. Describe the BLM's policy for road maintenance.
9. Develop new facilities only after the appropriate site-specific NEPA analysis and coordination with current lease or ROW holders and users.
10. Amend this Communications Site Management Plan as necessary in coordination with local, state and federal regulations and to be consistent with the management objectives of current and

future RMPs. The BLM will provide authorization holders with proposed amendments to this plan and will allow a reasonable period of time for the holders to review and comment on the proposed changes.

## **II. AUTHORITY AND DIRECTION**

### **A. Authority**

The authority used by BLM to authorize communications uses on public land (administered by the BLM) is the Federal Land Policy and Management Act of 1976, 90 Stat. 2776 (43 U.S. C. 1761-1771) and is reflected in Title 43, CFR, Sections 2801- 2808 and various BLM Washington Office Information Bulletins and Instruction Memoranda.

BLM authority for communications site management planning is contained in BLM Handbook 2801- 1, Plan of Development. Direction on and policy for communication use authorizations is contained in BLM Manual Section 2860.

Authority for the issuance of authorizations and/or licenses for the transmission and reception of electronic radiation for communication purposes is granted by Congress and administered by the FCC and/or the National Telecommunication and Information Administration – Interagency Radio Advisory Committee (NTIA/IRAC).

### **B. Relationship to Communications Site Leases/Right-Of-Way Grants**

This site plan will be incorporated into all leases and ROW grants issued (now and/or in the future) for this communications site and must be used in conjunction with the granting authorization. **PROVISIONS OF THIS SITE PLAN ARE ENFORCED THROUGH THE GRANTING AUTHORIZATION (LEASE OR ROW GRANT).** Each lessee or holder is expected to include the requirements of the authorization and this site plan into any documents, which describe the business relationship between the lessee and their tenants and customers. The lessee or holder is responsible for enforcing those provisions.

## **III. GENERAL RESPONSIBILITIES**

### **A. The Bureau of Land Management**

The BLM retains the responsibility for issuing and amending authorizing instruments to Facility Owners and Facility Managers, only for the areas actually occupied by the authorized improvements. The issuance of an FCC license (authorization), or frequency assignment, does not authorize occupancy of public land. Granting occupancy and use of public land, administered by the BLM, rests exclusively with the BLM. This includes:

1. Approving any new facility(ies) at the site.

2. Approving amendments to existing facilities (i.e. additions to tower, building, support facilities), and approving assignments of leases and ROW grants to qualified buyers of facilities on the site.
3. Approving any modifications to existing facilities including the tower, antenna, equipment or building. Also, approving any changes to the existing FCC licenses, prior to the submission of an application to the FCC. Federal Radio are licensed through the NTIA.
4. Frequency Management. The BLM is not normally responsible for the resolution of conflicts when the licensees or agencies are operating within the limits of the FCC and NTIA/IRAC authorizations.

**B. Facility Owners and Facility Managers**

Facility owners and facility managers (or their designated representatives) are responsible for:

1. Complying with their use authorization and all provisions of this site plan.
2. Ensuring that all new facilities, expansions, or improvements are consistent with the RSFO land use planning documents; any environmental document(s)/decisions for the site; and, this site plan.
3. Ensuring facilities/equipment not complying with Federal/State/local laws/regulations/ordinances will be removed or modified within one year of the approval of this plan. Any modification needs pre-approval by the BLM.
4. Keeping all facilities within the established limits of their authorized area.
5. Providing the BLM with the name, address and phone number for a local contact person. The Facility Owner and Facility Manager and the contact person may be the same individual. The contact person will be available for emergencies and will have the authority to make decisions about construction issues, facility maintenance and all equipment within the facility.
6. Providing 30-day notice to all facility owners/facility managers at the site, as well as the BLM, of all new frequencies proposed for the site. A completed BLM technical data sheet or equivalent must be sent with the 30-day notice to allow for comment of potential interference. This notification requirement applies to new frequencies for facility owners/facility managers as well as their tenants and customers
7. Adhering to the lease/ROW grant as follows:
  - a. Facility Owners and Facility Managers with Communications Use Leases are authorized to rent building/tower space to tenants and/or customers without prior written approval from the BLM.
  - b. Tenants and/or customers may not construct their own equipment shelter (building, shelter, generator pad, cabinet, etc.) or antenna support structure (tower or mast). The facility owner must own all communication shelters and towers under their lease or grant. [If that is not possible, a separate SF-299 application, cost-recovery fees, analysis, and



- authorization are required. This may also result in the use being a tenant/customer of the original lease/ROW in addition to being a separate facility for billing purposes.]
- c. Tenants and/or customers using a facility covered by a Facility lease/ROW will not have separate BLM leases/ROWs to authorize their use except in situations where regulations or policy require them.
  - d. Facility Owners and Facility Managers are responsible for complying with the terms and conditions of the facility lease/ROW. Facility Owners/Facility Managers are also responsible for ensuring that their tenants and customers are in compliance with the terms and conditions of the lease/ROW and applicable FCC or NTIA/IRAC license terms and conditions.
  - e. The Facility Owner and Facility Manager may not place any unreasonable restrictions nor any restriction restraining competition or trade practices on tenants and/or customers, or potential tenants and/or customers.
8. Ensuring that all communications equipment is properly installed, operated, and maintained.
  9. Ensuring that all communication equipment meets American National Standard Institute (ANSI), FCC and BLM regulations, guidelines and standards concerning radiation limitations by:
    - a. Monitoring radiation levels at their facility; and,
    - b. Immediately correcting any radiation levels that are, or could be a hazard to human health. (FCC 47 CFR sections 1.1307(b), 1.1310 and 2.1093) and FCC OET Bulletin 65, August 1997.
  10. Providing a certified copy of all uses and the correct category of uses within the facility, along with the current phone numbers and addresses of all tenants and customers as of September 30th each year. This report is due by October 15th each year.
  11. Keeping the premises around their buildings free of trash and debris.
  12. Placing the BLM lease/ROW serial number on the door of their communications site building, or on a gate if a fenced compound.
  13. Correcting all interference problems. The users are normally responsible for the resolution of conflicts when the licensees or agencies are operating within the limits of the FCC and NTIA/IRAC authorizations.

**C. Federal Communication Commission and National Telecommunication and Information Administration – Interagency Radio Advisory Committee**

The FCC and NTIA/IRAC are responsible for Frequency Management. The FCC and NTIA/IRAC are not normally responsible for the resolution of conflicts when the licensees or agencies are operating within the limits of the authorizations.

**IV. AUTHORIZED USES AND USERS WITHIN A FACILITY****Use by Multiple Users**

Use of all facilities and improvements by more than one user, known as co-location, will be required except where the facility owner is a government agency. Site applicants will take the lead in this area and design their proposals to accommodate multiple uses of facilities and improvements. This includes multiple uses of buildings, towers, back-up generators, grounding systems, fuel containers, access ways and parking areas.

BLM will not authorize a ROW expansion or modification until it is determined that existing authorized space and facilities are being used to capacity. Development or expansion of a ROW solely to preclude potential competitors from locating nearby is unacceptable and will not be authorized by the BLM.

Facility Owners and Facility Managers are not required to lease facility space to others if they can prove to the authorized BLM officer that:

1. Space is not available.
2. The use is incompatible with the existing facilities.
3. Additional space is needed by the facility owner/manager.
4. Additional users would violate system security needs.
5. Potential interference is not resolvable.

**V. FEES**

The BLM will charge Facility Owners and Facility Managers annual rental fees pursuant to federal regulations contained in 43 CFR 2806. The fees are based on two factors- the type of communications use, and the population served by the use. These fees are considered fair market value for the use of public land. The population Zone 9 (less than 25,000) will be used for these calculations unless something else is specifically agreed to in writing by the authorizing officer or until populations change.

Fees that Facility Owners and Facility Managers may charge their tenants and customers are to be reasonable (consistent with, and not in excess of, other fees for similar facilities) and commensurate with the uses and occupancy of the facilities and services provided to tenants and customers.

## **VI. GENERAL OPERATION AND MAINTENANCE DIRECTION**

### **A. Unique Resource Considerations at this Communication Site**

There are no currently identified special resource coordination considerations with on-site or adjacent resource values. Should special conditions arise through the revision process of the land use plan or other situations, this site plan will be amended accordingly.

### **B. Wiring and Grounding**

1. All equipment is to be installed within existing buildings and in metal equipment racks or within metal equipment cabinets and in accordance with manufacturers' specifications. All equipment, racks, cabinets and overhead ladder trays are to be grounded and shielded in compliance with National Electrical Code (NEC) and in accordance with accepted industry standards.
2. All electrical wiring and grounding must meet the NEC and applicable State/local codes. All permanent wiring shall be installed in metallic conduit. Surge protection shall be installed between the electric service meter and the first power distribution panel.
3. Lightning protection shall be in accordance with NEC part 810-20 Antenna Discharge Units and Part 810-21 Grounding Conductors. Periodic bonding of the antenna feed lines to the tower (when galvanized steel) shall be made with proper bonding connectors that are stainless steel (preferred), tin plated or made of brass.
4. Each building is to have its own separate grounding system for all users in that structure. Wherever practical, interconnection of individual grids and/or the simultaneous placement of a large sized copper ground wire with any new grounding systems that are buried on the site will be required.
5. Site or facility grounding must be constructed of copper, with #2 AWG or larger wire or 2" or larger solid copper strap, connected to an adequate site/facility ground electrode system. The site/facility ground electrode system shall be bonded to the power service entrance grounding electrode conductor. Guy wires should also be grounded using manufacturers approved methods to preclude bi-metallic junction and corrosion. All equipment on the site (buildings, towers, power units, transmitters, receivers, antennas, combiners, telephone systems, power cabinets, HVAC units, etc.) must be connected to the site/facility ground by direct connection. Electrical system ground wiring is required for electrical ground fault protection and circuit breaker coordination. The grounding systems shall comply with applicable laws, codes and in accordance with standard engineering practice. Below ground connections must use either an exothermic welding process (i.e. Cadweld, Thermoweld, etc.), copper wedge pressure devices (i.e. Ampact, Burndy, Wrench-lock, etc.), or brazed copper connections in conjunction with a mechanical UL listed connector (to be used as a physical strength enhancement component). Brazing by itself is not an acceptable method of bonding below earth grade (buried).

## C. Communications Equipment

### Equipment Ownership

All equipment shall be labeled (or the information available at the site, as applicable) with:

1. The owner's name.
2. Transmitter frequency(ies).
3. A valid FCC, or IRAF, authorization.
4. Transmitting power output(s).
5. A current 24-hour phone contact number.

### Transmitting Equipment

All transmitters will have protective devices (shields, filters, isolation components), designed into or externally installed, to prevent interference with other users. All transmitters will meet FCC licensing requirements. Two-way transmitters should have dual section isolators for a total of 60 dB of isolation.

The re-radiation of intercepted signals from any unprotected transmitter and its associated antenna system will be prevented by the use of appropriate filters (wide band and narrow band broadcast transmitters).

The direct radiation of out-of-band emissions (i.e. noise or spurious harmonics) will be reduced to a level such that they may not be identified as a source of interference as defined in the FCC Rules and Regulations (e.g. Part 90.209(e) for non-broadcast uses, and Parts 73 and 74 for broadcast uses). If site noise (electromagnetic noise) becomes an issue, noise threshold limits will be established, and amended into the site plan, prior to authorizing any new uses.

Direct radiation of out-of-bound emissions, (i.e. transmitter wide band noise, spurious emissions, harmonics, etc.) shall be reduced to a noninterference level by using bandpass, lowpass, and/or harmonic filtering. Where duplexing is used, use of a notch type device should be avoided.

Re-radiation of signals from a transmitter and its associated antenna system shall be prevented by installing appropriate devices (i.e. ferrite isolators), with minimum return loss of 25 dB.

All transmitters not in immediate use and not specifically designated as standby equipment shall be removed. Loads connected to circulators are to be capable of dissipating the total power output of the transmitter.

### Receiving Equipment

All receivers shall comply with all applicable parts of the FCC rules, including Parts 2 and 15.

All receivers shall have sufficient “front end” pre-selection to prevent receiver spurious response. The use of bandpass, band-reject cavity or crystal filters may be required to prevent receiver-produced intermodulation or adjacent-channel interference.

Where duplexing is used, a bandpass cavity duplexer is required. Use of the notch-type device is not permitted. Where notch-type devices are currently in place and there are no interference problems, their use may continue until the equipment is replaced, at which time they must be replaced with bandpass devices.

### Tower

Generally, only one tower is authorized for each facility owner. Facility Owners and Facility Managers may obtain permission to construct the second tower only after submitting evidence that demonstrates that their existing tower is completely filled and full use has been made of combining systems.

1. All towers will be left unpainted, if they are dull, galvanized steel. Paint is required only if the tower has a shiny (i.e., reflective) surface. If paint is required, the BLM will approve only non-reflective colors from the Munsell Soil Color Chart, Standard Environmental Colors, or the equivalent.
2. Maximum tower height for future towers at this site is 80 feet.
3. Anti-climb devices, removable steps, or other means to discourage unauthorized climbing, are highly recommended to reduce or avoid liability claims.
4. All new towers will be self-supporting. No guy lines are permitted.
5. To avoid possible impacts to birds or bats, follow the most current version of the U.S. Fish and Wildlife Service’s Interim Guidelines on the Siting, Construction, Operation and Decommissioning of Communication Towers, available at the following website:  
<http://migratorybirds.fws.gov/issues/towers/comtow.html>

### Antennas

1. Microwave (dish) antennas (other than ground mounted satellite dishes) will be limited to a maximum of eight (8) feet in diameter. The smallest diameter dishes are preferred if technically feasible.
2. Dishes should be mounted as low as possible to reduce visual impacts.
3. All antennas must meet all Occupational Safety and Health Administration safety standards. If an antenna exceeds FCC public radiation standards (see FCC OET Bulletin 65) at ground level in publicly accessible areas, it will be remedied within 24 hours after measurements are taken or isolated (e.g., fencing, signing, relocation, lowering power levels are all possible remedies). Ground measurements of RFR levels will be taken before mitigation measures are implemented.

4. Color(s) for dish antennas, or covers, must be pre-approved by the BLM. New white dish antennas and/or covers will not be approved. Existing white dishes and covers must be repainted or replaced with dishes of approved color (typically dark grey), as repairs or replacement become necessary.
5. Antennas will be purchased with or treated to have a non-reflective surface.

### Interference

The responsibility for correcting interference problems is a matter for resolution between the lease/ROW holder of the facility(ies), the user causing the interference, and the affected party(ies). First users on a site have seniority with respect to the resolution of interference complaints. Senior holders have an obligation to maintain their equipment to industry standards, to operate their systems in accordance with the terms of both the FCC license and NTIA/IRAC frequency authorization, and to comply with the BLM authorization.

New users on a site must correct, at their expense, interference problems that they create. They may be required to furnish an intermodulation study, electromagnetic noise study, or other interference-related data and must agree to accept financial responsibility for elimination or prevention of any interference caused by the facility before their application can be evaluated. They must cease operation of the suspect equipment until the problem is corrected. If interference problems cannot be resolved or corrected within a reasonable time, the new use that is causing the interference may be terminated and the equipment removed.

All users shall cooperate with the Site Users Association, if one is formed, and the BLM in identification and correction of any interference. The BLM does not have authority for correcting interference problems but can act as a mediator to help all affected parties. Interference problems must be coordinated with the FCC or NTIA/IRAC, whichever is appropriate.

Interference with law enforcement and/or emergency communications must be corrected immediately. The operation of equipment covered by this site plan shall not interfere with United States Government radio or electronic operations already in existence on public land within two (2) miles of this site. The user causing this interference, shall, at its own expense, take all action necessary to prevent or eliminate such interferences. If it does not eliminate such interference within ten (10) days after receipt of notice from the BLM to do so, this use will be terminated.

If electromagnetic noise becomes an issue, noise thresholds will be established and this site plan will be amended accordingly.

### **D. Cables and Transmission Line (Wave Guides)**

All new cabling will be jacketed and shielded and shall either be flexible or semi-rigid type. Existing substandard cables will be upgraded as repairs or replacement become necessary.

Cables will be properly installed and will be strapped and fastened down. Use of ports at building entrance points will be kept to a minimum by use of combiners.

When attaching power cables onto a tower, conduits should be used. Coax and wave guides should be installed in a wave guide ladder or equally divided among all tower legs.

All transmission lines (wave guides) are to be supported in accordance with manufacturer's specifications.

Unjacketed transmission line of any type is prohibited. No transmission line shall be left unterminated.

Double shielded braided or solid shielded cable will be used. No RG-8 type cable is permitted. No connector-type adapters will be used on transmission lines. Only correct connectors that will mate to connected devices are to be used.

Conduits will be shared when they service common areas and will be buried where possible.

#### **E. Radiation**

All communications uses must meet ANSI, FCC and BLM regulations guidelines and standards concerning radiation limitations. This site is considered uncontrolled for the purposes of compliance with RFR standards.

Monitoring radiation levels at the site is the responsibility of all site users and will occur at intervals to comply with FCC regulations and guidelines. A copy of these monitoring reports will be provided to the BLM upon request. The FCC is responsible for enforcement of the monitoring and standardization for compliance. The FCC could revoke the license and/or issue a fine for failure to comply. Additionally, the BLM could terminate or suspend the use authorization for failure to comply.

Onsite RFR measurements will be taken using appropriate equipment that can adequately measure and record both on-tower and on-the-ground levels before mitigation measures related to RFR are implemented pursuant to FCC standards and requirements.

Security fences with RFR notice signs are required around areas that exceed public use levels including anchor points outside the primary facility compound fence, if necessary. Raising higher power transmitting antenna on the tower or modifying the antenna type to half wavelength may be necessary to eliminate RFR hazards. Reducing power may also be required if other alternatives are not feasible. All fencing location and design or new tower construction must be pre-approved by the BLM.

Warning signs will comply with ANSI C95.2 color, symbol, and content conventions. Contact information including name and telephone number will also be included on warning signs. Existing warning signs compliant with FCC 47 CFR 1.1307(b) which do not currently include name and telephone number will be accepted as long as the name and telephone number is clearly posted on other signage at the Lessee's site.

Lowering power levels for on-tower access during maintenance will be coordinated between affected users.

Any identified RFR problems that are, or could be, a human health hazard must be corrected within 24 hours after measurement tests have been completed or be removed from the site by the site user(s). If the proposed corrective action involves any new ground disturbance, it must be pre-approved by the BLM.

#### **F. Utilities-Availability of and Requirements for:**

##### Commercial Electrical Power

Commercial power is provided to the site under a separate ROW grant to Pacific Power and Light (WYW 266495). The current electrical service to the site has the capacity to service additional users at the site. Future upgrades of the electrical service will be part of the ROW to Pacific Power and Light and may need to be paid for by the benefiting user(s).

##### Telephone Service

If telephone service is ever deemed necessary, a separate ROW grant will be issued. Site users will also pay for the cost of:

1. The necessary resource surveys and reports for service connections.
2. The cost of constructing service connections.

For visual reasons, overhead utility poles may not be authorized.

##### Fuel Tanks

Facility Owners and Facility Managers are responsible for providing fuel storage (propane and diesel) and emergency power for their tenants and customers. No tenants or customers will be authorized to have separate fuel tanks and/or generators. Each facility owner will preferably consolidate fuel storage into a tank large enough in size to accommodate all tenants and customers within their facility. At a minimum, tanks will be grouped together in a consolidated area adjacent to their facilities. All fuel, storage tanks (e.g. LPG, propane and diesel) must meet current fire department, Federal, State and local government safety and hazardous materials requirements. Propane is the preferred fuel for future generators.

1. All tanks will be:
  - a. Signed in red letters, "SMOKING OR OPEN FLAME PROHIBITED WITHIN 20 FEET"
  - b. In conformance with National Fire Protection Association requirements
  - c. Painted an approved color or screened by an enclosure to blend in with the natural environment. If an enclosure is used, it must be pre-approved and painted an approved color from the Munsell Soil Color Chart, Standard Environmental Colors.
2. Diesel tanks will also be:



- a. Enclosed in BLM and fire department approved secondary containment vaults that are painted a BLM approved color from the Munsell Soil Color Chart, Standard Environmental Colors.
- b. Constructed with underground fuel lines. Fuel line must be constructed of black, treated pipe and fittings, and must be posted.
- c. A containment basin must be maintained below all diesel tanks which are not designed and approved to be self-contained.

### **G. Sanitary Facilities**

Plans for any sanitary facilities must be pre-approved by the BLM. If it is determined by the BLM that the users need such facilities, they will be provided by the lease/ROW holder in a manner and location satisfactory to the BLM and within the requirements of the Sweetwater County Health Department.

### **H. Security and Law Enforcement**

The Sweetwater County Sheriff's Department is the key law enforcement agency for the area. They are responsible for most civil and criminal matters. The BLM will be responsible for enforcing matters related to uses of BLM lands (e.g. resource protection issues).

Patrolling and policing for security purposes is the user's responsibility.

None of the facilities on Aspen Mountain are currently fenced. If fencing is ever deemed necessary for security purposes at other facilities on the site, it must meet the following criteria:

1. All fences must meet health and safety requirements.
2. All fence locations and design require BLM pre-approval. The standard fencing type will be chain-link (i.e. cyclone).
3. The standard fence height will be eight (8) feet.
4. Fencing will be designed, installed, maintained, and of a type to minimize interference issues as described in the Motorola R-56 standards.
5. Fences will be signed with RFR notices if RFR is above public levels.

### **I. Site Maintenance**

The objective of maintenance activities is to present a clean, neat, and orderly appearance at the site and have all of the authorized improvements safe for workers and the public. All users will keep up the overall appearance of the site.

Miscellaneous debris remaining after any construction and/or equipment installation, removal or modification, is not only a hazard, but can cause interference or intermodulation problems. In particular, all loose wire or metal objects are to be removed from the site.

The users of the site will remove all graffiti within 10 working days of finding it, weather permitting.

Users will not be permitted to leave or dispose of trash, garbage or cut brush on public lands. No outside trash or litter containers will be provided. Site users will remove litter from the site as it is produced.

Policing of litter in common areas (i.e. areas between buildings and developed sites) is the shared responsibility of those holders bordering these areas.

During construction and/or maintenance, excess materials (e.g. cement, wire, metal, building materials) will be removed from public land.

Peeling paint on buildings and/or towers will be re-painted within thirty (30) days of discovery by the facility owner or facility manager and within 10 days of notification of the holder by the BLM, weather permitting.

The Lessee is responsible for the abatement and control of noxious weeds within the bounds of their lease site and common use areas. Abatement practices are to be implemented in accordance with the RSFO weed abatement programs.

## **J. Inspections**

Enforcement authority is vested in the BLM as the Communications Site Administrator for Aspen Mountain via 43 CFR 2800. The BLM may conduct an annual inspection of each user's facility. This inspection will verify:

1. Compliance with technical standards.
2. Structural integrity.
3. As-built plan accuracy.
4. Electromagnetic compatibility.
5. General site health, safety, and cleanliness.

The BLM shall provide written notice of the scheduled inspection date at least 30 days in advance. Each user shall arrange to have personnel available at the site at the time of the inspection.

Any non-compliance found by a user shall be reported to the BLM. The BLM will conduct an inspection and a written copy of the inspection report shall be forwarded to the violating user within 30 working days following the inspection. The report shall include:

1. A description of the violation.
2. Corrective action required.

3. Name, address, and organization of the responsible party.
4. Time allowed for completion of corrective measures.
5. Anticipated action in the event of noncompliance with remedial instructions.

#### **K. Fire Prevention and Hazard Reduction Requirements**

Facility Owners and Facility Managers will be required to control vegetation within the fenced area around their facilities. Gravel or mineral soil (i.e. bare ground) must be maintained to a minimum of (10) feet clearance around buildings and a minimum of (10) feet clearance around any propane tanks. Identified threatened, endangered, or sensitive plant species must remain within the minimum clearance areas.

Smoking is prohibited in flammable vegetation areas.

Roof structures shall be kept reasonably clear of debris at all times.

No explosives will be stored at this site. Flammable materials shall be stored in conformance with the requirements of local fire regulations. Flammables will be placed in closed containers and stored away from sources of ignition and combustible materials. If flammables are stored within a building, the building will be locked, properly signed and well ventilated.

Approved spark arresters will be required and maintained on all internal combustion engines.

At least one (1) U.L. rated 20 lb. A:B:C dry chemical fire extinguisher is required inside each building. Prior to each June, fire extinguisher(s) shall be inspected by holders and refilled, if necessary.

Any fire will be immediately reported to “911”, the nearest BLM office and/or Sweetwater County Sheriff.

BLM Officers will make periodic fire prevention inspections. They will call to the holder’s attention any lack of compliance with the above regulations, plus any other existing hazards. Compliance with these inspections is required within the time limits specified in the inspection report.

All fire protection standards must be accomplished by the beginning of fire season unless otherwise agreed to, and then maintained throughout the fire season.

For new construction, the BLM will provide the Holder with a separate Construction Fire Plan which will be prepared at that time as applicable

#### **L. Access Maintenance and Restrictions**

##### Roads

If a user association is formed on Aspen Mountain, the costs of road maintenance will be assessed by the association and enforced through this management plan. If a user association is not formed, maintenance costs will be assessed depending on the amount of use on the road. If there is disagreement among users as to the assessed costs, BLM will determine the costs to be borne by each leaseholder.

Individual users who damage or disturb the access road, or any associated structures, such as ditches, culverts, roadside vegetation, signs and/or underground utilities or facilities, will be required to repair the road and/or associated structures, to conditions equal to or superior to those prior to any damage or disturbance. This work must be done according to applicable road maintenance standards per BLM manual Section 9113 and may require the appropriate NEPA analysis.

#### Interior Site Driveways/ Parking Areas

Interior site driveways within the communications site will be maintained by the site users. Interior roads will be planned and approved during establishment of new facilities. Interior roads will be maintained in a manner to allow only one entrance to the site. Off-road vehicle use by a user in and around the communication site will be avoided.

#### Road Closures

Native surface roads are subject to periodic closures to entry during periods of extreme fire danger, inclement weather, or wet conditions. Authorized site users may use the site during these periods but should use judgment and may need to seek advance approval from the BLM.

## **VII. CONDITIONS FOR CONSTRUCTION, MODIFICATIONS OR EXPANSION**

### **A. Facility Owner/Manager Responsibilities**

In addition to the responsibilities listed in Section III, new applicants and existing Facility Owners/Managers proposing new, modified, or expanded facilities are responsible for:

1. Submitting a complete application to the RSFO (ATTN: "Realty Specialist") prior to any new construction or modifications to existing improvements, unless new electronic equipment is being installed in/on an existing tower and/or an existing building. The application must include:
  - a. The appropriate cost recovery and application fees as determined by BLM.
  - b. A copy of the approved Site Plan Base Map showing all of the proposed (new) facilities including structures, towers, and auxiliary equipment.
  - c. Completed drawings/plans prepared by a registered engineer and Plan of Development approved by the BLM.

- d. Identification of any microwave beam paths, a plot of their azimuth(s), and their proposed elevation(s) on the tower.
  - e. Documentation that shows that proposed facilities will not be obstructing, or interfering with, any existing fixed point to point antennas, omni-directional broadcast antennas, or microwave beam paths in the directions of primary population targets. Proposed beam path needs must be shown on Site Plan Base Map.
  - f. Any needed recommendations, changes or modifications to their original proposal, based on any required resource surveys and/or reports.
2. Demonstrating that their proposals will not cause undue interference with any existing uses before the BLM can approve new facilities. In addition, it is the applicant's responsibility to show that any new facilities will make the most efficient use of the limited amount of space at the site.
  3. Showing their proposals will provide for future users without additional construction.
  4. Providing engineering and geotechnical investigations for development of specific foundation designs and grading plans.
  5. Provide for erosion control as part of the Plan of Development prior to construction activities. At a minimum, erosion control must include: sediment control, stipulations that cut/fill slopes will be graded and contoured to prevent erosion and/or excessive runoff, and recommendations for temporary erosion control measures, (e.g. netting, silt fences, swales, and/or sediment collection areas).
  6. Coordinating with other Federal (e.g., FCC and Federal Aviation Administration (FAA)), State and County agencies and obtain all required approvals and/or permits.
  7. Providing 30-day notice to all facility owners/facility managers at the site, as well as the BLM, of all new frequencies proposed for the site. A completed BLM technical data sheet or equivalent must be sent with the 30-day notice to allow for comment of potential interference. This would be for new frequencies for themselves and their tenants and customers.
  8. Insuring that all written approvals have been obtained from the BLM prior to construction. In addition:
    - a. Directional antennas will only be protected within the arch between their licensed 3 dB points.
    - b. New and/or modified facilities will not obstruct existing fixed point-to-point antennas or omni-directional broadcast antennas in directions of primary population targets.

## **B. Construction Methods and Resource Protection**

Plans submitted by an applicant for any new construction or modifications shall specify provisions for soil rehabilitation measures including, but not limited to, soil replacement and stabilization and for proper handling of runoff from buildings, parking area, access roads, and undeveloped common areas.

The following methods and resource protection measures will be required to minimize impacts during construction:

1. Avoid and protect sensitive resource areas, as identified by the BLM.
2. Compliance with the Plan of Development and the Erosion Control Plan.
3. During construction and/or maintenance, no paint or paint thinners will be disposed of on site.
4. Minimize ground disturbance and vegetation removal as much as possible during construction activities. All ground-disturbing activities require BLM pre-approval.
5. Disturbed areas will be re-vegetated with species pre-approved by BLM as soon as possible after construction. If necessary, reseeded will be required until vegetation is successfully established as determined by the BLM.
6. No grading material will be cast off during construction/reconstruction activities. Excess soil can be used for fill material on road and/or building/tower pads.
7. Temporary, on-site storage of construction materials will require pre-approval by the BLM.
8. Construction materials and supplies, except for hazardous materials (see number 9 below), may be left unattended at the construction site at the end of each workday, but at the owner's risk.
9. Hazardous materials, including, but not limited to all fuels, oils, and lubricants are not to be left unattended at the site at any time. During construction, these materials are to be removed from the site at the end of each workday, or temporarily stored inside a locked and signed building until the following workday.
10. All surplus construction materials and/or waste debris must be removed from the site no later than thirty (30) days after construction has been completed.
11. Any earth moving or heavy equipment (e.g. dozers, graders, cranes, backhoes, etc.) leaving the designated roadway and/or approved parking area(s) to perform authorized activities at the site, will be washed off prior to being brought onto public lands to prevent the introduction and spread of noxious weeds into the area.

**C. Construction Inspection**

1. All new construction, reconstruction, or major modification shall conform to the established technical standards and accepted engineering practices (i.e., the Uniform Building Code).
2. Any construction inspections required by other applicable agencies are the responsibility of the lessee/holder. Copies of completed inspections are to be provided to the RSFO, AO, either as they occur or as part of the final as-built plan. Inspection information shall become a permanent part of the holder's lease/ROW case file.
3. The Lessee/Holder agrees that corrective work detailed in BLM, or other agency required compliance inspections, would be completed by the scheduled completion date. If the Lessee/Holder disagrees or has questions about specific items, the Lessee/Holder must contact the BLM in order that the disagreement or item may be resolved.
4. A final set of as-built plans will be submitted to the RSFO, AO, within 90 days of acceptance of structure (if contracted) or of completion date.

**D. New or Remodeled/Expanded Buildings**

1. Any new buildings must be designed to accommodate multiple users along with fitting into the physical environment as defined in a site-specific environmental analysis developed at the time of the proposal.
2. Buildings are required to be one-story. The roof must be metal or covered with metal to be fire resistant. Roofs can be equipped with antenna support structures, such as poles and railings that can extend up to 25-feet above ground level.
3. Facility Owners and Facility Managers are encouraged to construct the interior of their buildings in a modular fashion, so that they can:
  - a. Sublease sections to others.
  - b. Provide tenants and customers with internal separation and security.
  - c. Reduce physical interference.
  - d. Increase management effectiveness.
4. The following materials are approved for construction of new facilities (i.e. buildings)
  - a. Floors – Concrete slab with drainage.
  - b. Walls – Concrete block metal or pre-fabricated concrete.
  - c. Roof – Metal, or concrete, if painted to eliminate shiny surfaces, or other fireproof material as approved by the BLM. Proposals for wooden roofs will not be approved.

- d. Partitions – If it is felt partitions are necessary in buildings, ensure they are constructed with fire resistant material (e.g., concrete block, reinforced concrete, or properly grounded fencing).
  - e. Color – Proposed color for use on all exterior building surfaces must be pre-approved by the BLM. The goal of the color selection for the facilities is to make the building as inconspicuous as possible and make buildings located on the skyline look inconspicuous when viewed from a distance. The intent is to reduce or eliminate glare from reflective and/or illuminated surfaces such as windowpanes, sheeting and reflective paints. Non-reflective, BLM approved colors will be used on equipment buildings.
5. Building entry lights must:
- a. Only light the immediate area in the vicinity of the door.
  - b. Be motion activated and have a limited time duration (e.g., 3-5 minutes).
  - c. Have a shielded beam that is pointed at the building door.

Requests for all-night (i.e. “dusk-to-dawn”) lighting, or entry lighting that would be visible from outside of the site will not be approved. FAA required lighting would be the only exception.

**E. New or Remodeled/Expanded Towers**

1. All new construction, reconstruction, and modifications to towers will be pre-approved by the BLM prior to implementation.
2. It is the applicant/holder’s responsibility to assure that a new, or modified, structure will not unduly interfere electronically or physically with any existing equipment at the site. Towers must be spaced, so as to prevent ground level radiation and/or interference problems. This must be clearly demonstrated in writing to the BLM prior to issuance of a new lease/ROW or amendment.
3. All new towers will comply with current structural and safety specifications and design standards, including safety-climbing devices. Towers should be as narrow and “open” as safety and structural integrity allow. New towers will be designed using maximum wind, snow, and/or tower loading anticipated for the site.

<b><u>VIII. SITE ASSOCIATION/ADVISORY GROUP</u></b>
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A Site Users' Association is recommended at this site. If formed in the future, all lease and ROW holders would be encouraged to join the association. The goal of the association would be to maximize the effective use of the site, coordinate access and maintenance. The objective of a sanctioned association would also be to represent all site users as a group when dealing with the BLM RSFO on matters relating to the site administration. The association would be able to work in cooperation with the BLM to identify problems or opportunities and make recommendations to the BLM for any changes in management strategies at the site. The association could also provide input to the BLM regarding the future addition of equipment and facilities at the site. While the advice and recommendations of the association would not be binding on the BLM, the BLM could use the input for administration of the site. The BLM would be a member of such a group and would help jointly develop the charter (i.e., the ground rules).

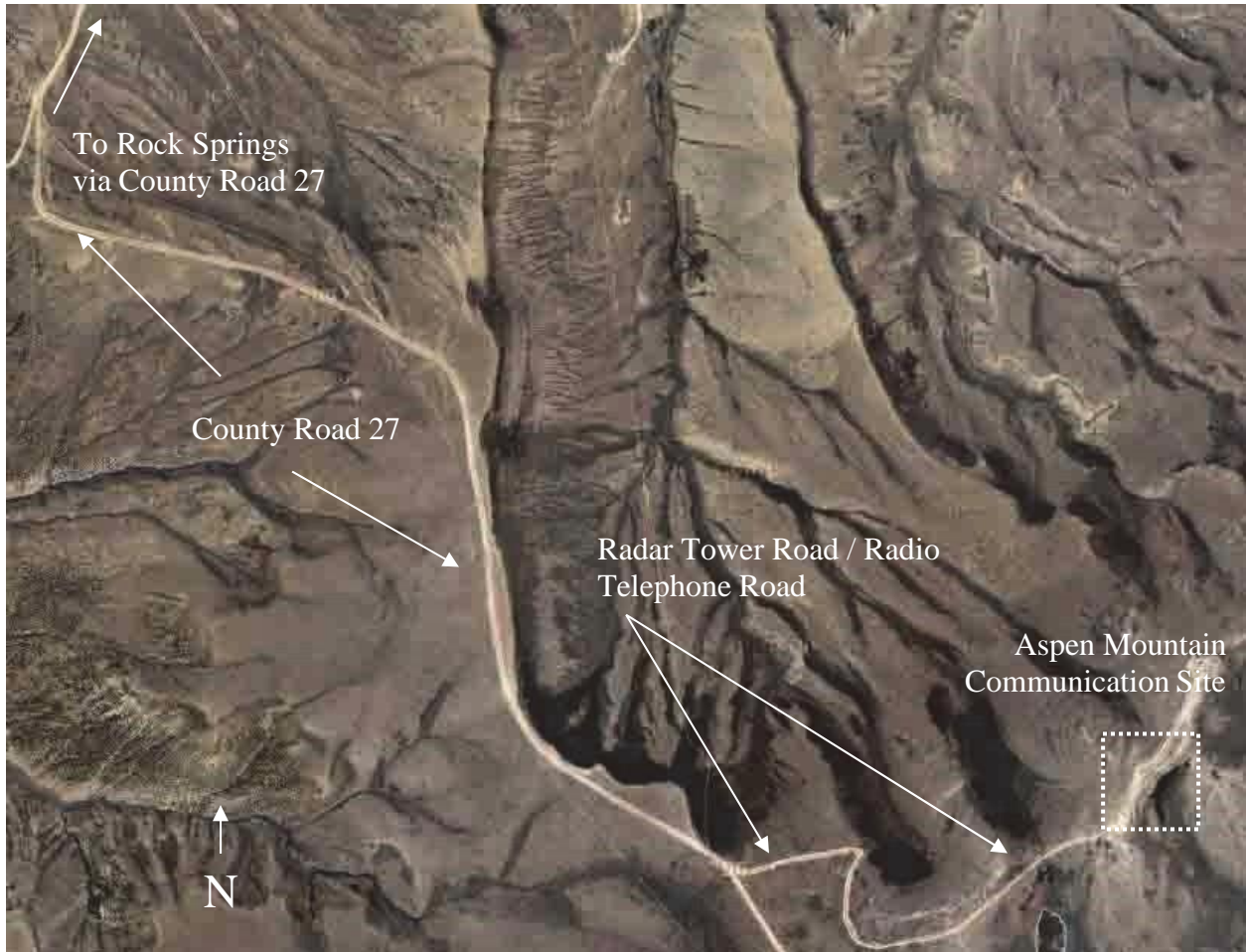
The goal of the Site Association would also be to maximize the effective use of the site. The objective of a sanctioned association will be to represent all site users as a group when dealing with the RSFO on matters relating to the Site administration. The association would be able to work in cooperation with the BLM to identify problems or opportunities and make recommendations to these entities for any changes in management strategies at the site. The association could also provide input to these entities regarding the future addition of equipment and facilities at the site. While the advice and recommendations of the association would not be binding on these entities, they could use the input for administration of the site. The BLM would be a member of such a group and would help jointly develop the charter (i.e., the ground rules).

In the absence of a formal Site Association, the BLM may utilize a Site Advisory Group that can make suggestions and/or recommendations to specific problems associated with the administration of the site.

## **IX. APPENDICES**

- A. **Location and Site Maps**
- B. **Authorized Facilities**
- C. **Site Photographs**
- D. **Inspection Checklist**

**APPENDIX A**  
**LOCATION MAP**



SITE MAP



**APPENDIX B****ASPEN MOUNTAIN COMMUNICATIONS SITE LESSEE/HOLDER FACILITY TABLE**




(See associated User's Table on the Website)

	<b>Auth #</b>	<b>Use</b>	<b>Building</b>	<b>Tower</b>	<b>Access/Parking</b>	<b>Other</b>
<b>Facility #1 Colorado Interstate Gas</b>	<b>WYW53936</b>	<b>PMRS</b>	<b>6' x 10' Fabricated  6' x 8' Aggregate</b>	<b>75' lattice self- supported</b>	<b>Access and parking</b>	<b>14 KW Generator, 500 gal. propane tank</b>
<b>Facility #2 Communications Technology, Inc.</b>	<b>WYW 105090</b>	<b>FAM</b>	<b>8' x 8' Corrugate  8' x 8' Fabricated</b>	<b>60' Guyed  50' guyed</b>	<b>Access and parking</b>	<b>50 KW Generator, 200 gal. propane tank</b>
<b>Facility #3 BLM</b>	<b>WYW52096</b>	<b>PMRS</b>	<b>8'x16' Fiberglass</b>	<b>80' lattice</b>	<b>Access and parking</b>	<b>None</b>
<b>Facility #4 Sterlings Communication</b>	<b>WYW 167541</b>	<b>PMRS</b>	<b>8' x 20' Steel Container</b>	<b>None</b>	<b>Access and parking</b>	<b>None</b>
<b>Facility #5 QWEST</b>	<b>WYW 107566</b>	<b>Micro</b>	<b>10' x 12' 6' x 8' 8' x 16'</b>	<b>40' Guyed 30' Lattice self- supported</b>	<b>Access and parking</b>	<b>12.5 KW Generator, 500 gal. propane tank</b>

**APPENDIX C**

**SITE PHOTOGRAPHS**

(See associated Facility Photos on the Website)

	<p>Facility No. 1</p>
	<p>Facility No. 2</p>
	<p>Facility No. 3</p>



Facility No. 4



Facility No. 5

**APPENDIX D**

**“Aspen Mountain Annual Technical Inspection”**

Date Inspected: \_\_\_\_\_ Time Inspection: \_\_\_\_\_

Permit Holder: \_\_\_\_\_ Authorization # \_\_\_\_\_

Site Technician: \_\_\_\_\_ Phone # \_\_\_\_\_

Number of Transmitters \_\_\_\_\_ License Posted \_\_\_\_\_

*Please mark the following Items as Acceptable (A) or Unacceptable (U).*

Electrical Wiring ----- (A) (U)                      Grounding ----- (A) (U)

Equipment Installation ----- (A) (U)                      Housekeeping ----- (A) (U)

Building Repair ----- (A) (U)                      Tower Repair ----- (A) (U)

*Please mark the following Items as Yes (Y) or NO (N) or (NA)*

Isolators ----- (Y) (N) (NA)                      Circulators ----- (Y) (N) (NA)

Cavities ----- (Y) (N) (NA)                      Terminators ----- (Y) (N) (NA)

Filters ----- (Y) (N) (NA)                      Lightning Protection ----- (Y) (N) (NA)

Comments: \_\_\_\_\_

\_\_\_\_\_

Recommended Corrective Action: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Required Corrective Action to Be Taken: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Committee Representatives: \_\_\_\_\_

Bureau of Land Management Representatives: \_\_\_\_\_

*Please make the required corrective action within the next 120 days. Please make a written report of corrective action taken and submit to the BLM. If you should have any questions, please call the BLM office.*

# APPENDIX N—TECHNICAL REPORT: SOCIAL AND ECONOMIC IMPACT ANALYSIS METHOD

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## N.1 GENERAL ASPECTS OF THE METHODOLOGIES

### N.1.1 Assumptions

The following basic assumptions underlie all of the social and economic analyses:

- Economic contributions to the socioeconomic study area, in terms of labor earnings and employment, would accrue from activities on Bureau of Land Management (BLM)-administered land such as oil and gas development, coal production, trona (soda ash) production, livestock grazing, and recreation.
- Nonmarket values, including both use and nonuse values would accrue from BLM lands, including ecosystem services on those lands.
- Employment and income (especially labor earnings) would continue to be a driver of economic and population growth in the socioeconomic study area.
- Housing supply and costs and community infrastructure and services may be constraints on population growth in some locations within the planning area.
- Tax and royalty revenues derived from activities on BLM-administered lands would continue to have fiscal implications for communities within the socioeconomic study area, the state, and the Federal Government.
- Activities and resources available in and around the planning area would continue to be important to the quality of life of current and future residents.
- The pace and timing of mineral development activities is dependent on a variety of factors outside the management decisions of the BLM. These include national and international energy and sodium product demand and prices, production factors within the planning area, and business strategies of operators.



- Future oil and gas drilling and production will be as projected in the Reasonable Foreseeable Development (RFD). As discussed above, actual drilling and production of federal minerals, and the economic impacts associated with these activities, may deviate from the RFD for variety of reasons outside the management decisions of the BLM. Actual economic impacts could vary if actual development or production varies from the RFD projections, or if prices change.
- Demand for use of BLM-administered land for livestock grazing will continue through the study period.
- Demand for use of BLM-administered land for recreational activities, including off-highway vehicle (OHV) use, throughout the planning area will remain steady or increase through the study period.

The discussions below of the specific methodologies for each resource use provide additional assumptions used in the analyses.

## **N.1.2 Quantitative Economic Impact Analysis Using IMPLAN**

The economic impact analysis uses two general approaches. These are quantitative analysis, and qualitative analysis.

The quantitative analysis approach is used when possible, given adequate available information and resources. In this study, adequate data was available for five resource uses:

- Oil and gas development and production
- Coal production
- Trona (soda ash) production
- Livestock grazing
- Recreation

The basic strategy used in quantitative economic impact analysis is to first identify the direct impacts of an economic activity affected by management decisions. For instance, direct impacts include expenditures made by oil and gas companies to drill a well, and to complete the well for production. Primary impacts also include the value of the oil and gas that is produced and sold. Next, where primary impacts can be quantified, they can generally also be run through an economic model to estimate the total economic activity that is generated as the primary impact ripples through the economy, as the directly affected industries purchase goods and services that are necessary inputs to production, and as labor income generated from production is spent by the households that receive the income.

The total economic effects are estimated in this study through use of the IMPLAN (IMPact analysis for PLANning) model. The IMPLAN model was originally developed by the U.S. Forest Service and is commonly used by the BLM and many other government and private sector organizations to estimate the total economic impacts of various activities, actions, and policies. The model tracks inter-industry and consumer spending in a local (or regional) economy, allowing estimation of indirect and induced economic impacts in the local economy that result from the original economic activity or a change in economic activity. Indirect impacts result from local inter-industry purchases caused by the direct impact, and induced impacts results from re-spending of labor income (i.e., local purchases by households of employees and proprietors of the affected industries). The re-spending represented by indirect and induced impacts is often referred to as the “multiplier effect.”

Outputs of the IMPLAN model include economic output, labor income, and employment. These are defined as follows:<sup>1</sup>

**Employment (jobs)** – A job in IMPLAN equals the annual average of monthly jobs in that industry.<sup>2</sup> Thus, one job lasting 12 months equals two jobs lasting six months each, equals three jobs lasting four months each. It is important to note that IMPLAN, based on some of its data sources, does not distinguish between full-time and part-time jobs. Sectors with higher labor earnings per job are likely to reflect a high proportion of full-time jobs, while sectors with low labor earnings per job often reflect a significant number of part-time jobs.

**Labor Income (earnings)** – All forms of employment income, including Employee Compensation (wages and benefits) and Proprietor Income.

**Economic Output (gross regional economic output)** – Output represents the value of industry production. In IMPLAN these are annual production estimates for the year of the data set and are in producer prices. For manufacturers, output is sales plus or minus change in inventory. For service sectors, output equals sales. For retail and wholesale trade, output equals gross margin, not gross sales.

By constructing “social accounts” that describe the structure and function of a specific economy, IMPLAN creates a *localized* model to investigate the consequences of projected economic activity in a geographic region. The IMPLAN model uses data specific to the local economy wherever possible, but also uses some data based on national-level economic relationships. Therefore, the model benefits from “calibration” of some of its data to better reflect the local economy. For this study, IMPLAN was calibrated based on work the University of Wyoming has done with the model in Wyoming over many years, and with data specific to this study. The specific IMPLAN impact analysis methodologies and assumptions for each resource use are described below.

The analyses used Version 3.0 of the IMPLAN modeling system. The IMPLAN model is managed by and available from the IMPLAN Group, LLC (<http://implan.com/>).

## Study Area

The economic impact analyses were conducted for activities on federal lands administered by the Rock Springs Field Office (RSFO), with the economic impacts calculated for a study area consisting of the five counties in and around the field office that could potentially be most directly impacted by the management alternatives. These counties were:

- Fremont
- Lincoln
- Sublette
- Sweetwater
- Uinta

The rationale for defining the study area as these counties is provided in the Socioeconomic Baseline Report.

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<sup>1</sup> Based on the glossary from the website of the previous publisher of IMPLAN, the Minnesota IMPLAN Group. This website is no longer available.

<sup>2</sup> This is the same definition used nationally by the Quarterly Census of Employment and Wages, United States Bureau of Labor Statistics, and United States Bureau of Economic Analysis.

## Timeframe of the Analyses

Economic impacts were estimated across a 16-year time period (2016–2031). The oil and gas RFD scenario provided estimates for 2012–2031. However, the BLM determined the study period would begin in 2016 and it was not useful to incorporate estimates or actual values for years that had already passed when the IMPLAN analysis was conducted in mid-2016 and re-run in October of 2019 for final changes to the management alternatives. All other analyses were scoped to the same period.

## Base Year Dollars and Discounting

All dollar figures throughout the economic analysis are in constant 2014 dollars. This is the base year used in the IMPLAN model.

Some of the results tables of Chapter 4 represent the total value across the period 2016 to 2031. Values for future years are discounted to adjust for the “time value of money.” This is an economic concept that refers to the value of a given amount of money being less in the future. Most people, presented with a choice, would rather have a dollar now than a dollar 10 years from now, or even one year from now because the dollar can be put to productive use now. When monetary values of an action vary over time, economists adjust for the time value of money by applying an annual discount rate to the amounts in future years. This is different than adjusting for inflation, which is a loss in money’s value in the future due to a rise over time in prices for given products and services across the economy. The result of adjusting for the time value of money is known as the “present value.” Providing present values for 2016–2031 for all the economic impact analyses allows for comparison – based on a reasonably lengthy period, and subject to some differences in approach noted in each resource use summary section – of the relative economic impacts of each resource use.

The choice of a discount rate is a key analytical decision, because as the discount rate increases, the value of future dollars when “brought back to the present” decreases. Often economists use the discount rates recommended by the federal Office of Management and Budget (OMB) in Circular A-94, “Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs,” and Circular A-4, “Regulatory Analysis.” These documents recommend use of multiple discount rates to reflect different economic perspectives. Specifically, OMB recommends use of a 7% discount rate to reflect the average before-tax rate of return to private capital in the U.S. economy. Use of this discount rate reflects how industry makes capital allocation decisions. OMB additionally recommends a lower discount rate, 3%, to reflect the “social rate of time preference,” which addresses how policy affects private consumption decisions (OMB 1992, OMB 2003, OMB 2011). Accordingly, the BLM uses these discount rates in this Resource Management Plan (RMP)/Environment Impact Statement (EIS).

### N.1.3 Qualitative Economic Impact Analysis

In the other approach, where primary impacts cannot be readily quantified, often the economic impacts can still be described qualitatively. In such cases, the focus of the analysis is to describe the type of impact in a base scenario (in this planning effort, Alternative A) and then assess the relative changes (qualitative indications of increases or decreases in economic values) that would be likely under other alternatives. This approach may be used with impacts to market values and is often used with impacts to nonmarket values. The term nonmarket values refers to the benefits individuals attribute to experiences of the environment or uses of natural and cultural resources that do not involve market transactions and therefore lack prices. Because these values are not priced, they are difficult to estimate, but nonetheless BLM guidance calls for efforts to be made to identify and assess impacts to nonmarket values in the planning process (BLM Instruction Memorandum No. 2013-131, Guidance on Estimating Nonmarket Environmental Values, May 31, 2013).

Some of the management decisions under this planning action would result in increased expenses to operators – the firms or individuals who undertake the activities – or to project proponents. The economic impacts of decisions that increase expenses for operators and/or project proponents are many and can be complex. Expense increases may cut into profitability and drive delays to, reductions in, or cessation of operations or projects. However, where operations or projects are not delayed, reduced, or terminated, increased expenses also represent increased economic activity. For instance, if restrictions under an alternative result in a new power line having to take a longer route, additional expenditures for materials, equipment, and labor would be made. These increased expenditures would support some amount of additional income and employment. However, increased expenses may also represent opportunity costs; that is, the project proponent or society may have benefited more if the additional funds were used in another way. In the socioeconomic analysis in Chapter 4, where management actions would potentially increase expenses to operators or project proponents, these increased expenses are pointed out and discussed qualitatively. Readers should keep in mind that these increased expenses may negatively impact operators, may benefit others in society, and may incur opportunity costs.

#### **N.1.4 Social Impact Analysis**

Social impacts may be driven by economic impacts, such as when changes in employment due to management decisions lead to impacts on population, housing, and community services. Other impacts may be more purely social and cultural in nature and can include impacts on quality of life, recreation and amenity values, and traditional land uses and associated cultural values. Social impacts may be marginal or substantial, depending on the degree to which new and revised management actions alter the course set in previous BLM decisions.

Sometimes social impacts can be quantified; however, in this analysis social impacts are described qualitatively. This is because social impacts of BLM management decisions may vary considerably depending on the nature of the community(ies) involved. For a planning effort that covers as large a geographic area as this effort, analysis of social impacts must necessarily use a broad brush.

A key aspect of the social impacts analysis approach is to address impacts based on the varying points of view of key types of stakeholders. The Socioeconomic Baseline Report identifies several broad categories of stakeholders to BLM management decisions in the RSFO. These categories reflect different linkages people have to public lands. They also reflect distinct sets of attitudes, beliefs, values, opinions, and perceptions about public resources and the effects of various management policies and actions.

Categorization of stakeholders is not meant to imply that all individuals and social groups fit neatly into a single category; many specific individuals or organizations may have multiple interests and would see themselves reflected in more than one stakeholder category. The point of categorization is to allow differentiation of social impacts based on broad differences in points of view. The social impacts analysis assesses the alternatives against the different points of view in the broad stakeholder categories.

#### **N.1.5 Environmental Justice Impact Analysis**

Definitions and methods for analysis of potential environmental justice issues are described in the Socioeconomic Baseline Report. In short, the socioeconomic study area was screened to identify geographic subareas with minority and low-income populations that qualify as potential environmental justice populations based on guidance for environmental justice analysis from the Council on Environmental Quality. These subareas and their potential environmental justice populations are noted in Chapter 3 of the EIS as well as the Socioeconomic Baseline Report. Further assessment of the likelihood of impacts to these populations was conducted as described in Chapter 4 of the EIS.

## N.2 METHODOLOGIES BY RESOURCE USE

### N.2.1 Oil and Gas

#### Introduction

The analysis for oil and gas economic impacts was divided into two phases of oil and gas economic activity:

- Development (Drilling and Completion)
- Production

The analysis focuses only on *new* BLM-managed oil and gas wells on federal mineral estate within the RSFO. This is because the management decisions under consideration in the RMP essentially only apply to new oil and gas leasing and not to existing leases. The economic impact figures for the new oil and gas wells are a subset of the economic impacts of all oil and gas wells (new *and* existing) on federal mineral estate in the field office, which in turn are a subset of the economic impacts of all oil and gas wells on all federal *and non-federal* mineral estate in the field office (i.e., including wells on privately and state-owned mineral estate). Put another way, the impact estimates do *not* include the economic impacts of any existing wells on federal mineral estate, nor of any wells (new and existing) on non-federal mineral estate.<sup>3</sup>

Likewise, the percentage differences for Alternatives B, C, and D in comparison to Alternative A only represent changes for new wells on federal mineral estate; they do *not* represent the percentage change to *total* economic activity resulting from all oil and gas development and production. The percentage change to total oil- and gas-related economic activity would be smaller, because while the absolute difference between alternatives in dollars or jobs would be as shown in the tables in Chapter 4, the base for comparison, all oil- and gas-related economic activity, would be larger because it would include the contributions of existing wells on federal mineral estate and of wells on non-federal mineral estate.

#### IMPLAN Model Modifications

The IMPLAN modeling system utilizes national production coefficients. To better reflect local production practices, the oil and gas sectors of each model were modified. In IMPLAN, oil and gas development and production is divided into three sectors:

<u>Number</u>	<u>Sector Name</u>
20	Oil and Gas Extraction
37	Drilling Oil and Gas Wells
38	Support Activities for Oil and Gas Operations

The following protocol was used to modify the individual sectors. Total output for the Oil and Gas Extraction Sector was based on county level production quantities reported by the Wyoming Oil and Gas Commission and U.S. Energy Information Administration (EIA) 2016–2031 oil and gas price projections for Dakotas/Rocky Mountain Region (adjusted to 2014 dollars). Total output for the other two sectors was estimated from output per employee ratios derived from the United States Census Bureau’s Economic Census. Employment estimates were based on United States Bureau of Labor Statistics (BLS) covered employment data. These estimates were adjusted to account for self-employment using United States Bureau of Economic Analysis (BEA) data. Earnings were also based on BLS data. These estimates were adjusted to account for benefits using BEA data. Intermediate payments for oil and gas production were

<sup>3</sup> A nuance here is that the figures for oil and gas production do include estimated production from the wells the RFD estimated would be placed into service from 2012–2015. In the production estimates for each year from 2016 to 2031, it was not possible to separate out the production from the 2012–2015 wells from the total production.

scaled based on estimated cost of production for oil and gas production in the Rocky Mountain region. Additional industry sectors that receive some direct expenditures from oil and gas development did not require modification.

## Development (Drilling and Completion) Impacts

Information on the number of wells to be drilled in the RSFO for each alternative was obtained from the RFD scenario estimates provided by the BLM's RRD scenario. The RFD estimates were broken down between conventional and coalbed natural gas (CBNG) wells and by Bureau-managed wells and all wells. Conventional wells include both vertical or directional wells and horizontal wells. Only Bureau-managed wells were considered in this analysis.

The RFD estimated total wells drilled across the planning period. As shown by recent history, drilling activity can vary substantially from year to year. Therefore, the total estimated wells from the RFD were allocated equally to each year of the study period for the purposes of conducting the economic impact analysis. Based on data from three recent oil and gas EISs in the RSFO, the analysis assumed that approximately 84% of the new wells would be vertical/directional wells, and 16% would be horizontal wells. The success (completion) rate for new wells was assumed to be 85% for conventional wells and 95% for CBNG wells, based on recent experience as observed by the RSFO petroleum staff.

Table N-1 summarizes the oil and gas well drilling and completion costs used in the analysis. Estimates of per well drilling and completion costs for vertical/directional wells were based on data provided by industry for the Wyoming Greater Sage-Grouse Land Use Plan Amendments/EIS and validated by RSFO petroleum staff for this RMP/EIS. Estimates for horizontal well costs were provided by RSFO petroleum staff. Estimates for CBNG well costs were provided by BLM district office staff for the Wyoming Greater Sage-Grouse Land Use Plan Amendments/EIS and validated by RSFO petroleum staff for this RMP/EIS.

**Table N-1. Estimated Oil and Gas Costs Per Well in the Rock Springs Field Office  
(millions of 2014 dollars)**

	Conventional Drilling	Conventional Completion	Conventional Total	CBNG Drilling	CBNG Completion	CBNG Total
Vertical/ Directional	\$1.016	\$1.357	\$2.373	N.A.	N.A.	N.A.
Horizontal	\$5.500	\$4.500	\$10.000	N.A.	N.A.	N.A.
CBNG	N.A.	N.A.	N.A.	\$0.740	\$0.185	\$0.925

The percent of total well costs that were spent within the socioeconomic study area was estimated to be 71.4% for conventional well drilling, 74.6% for conventional well completion,<sup>4</sup> 83.1% for CBNG drilling, and 53.5% for CBNG completion. The percentages for the conventional well estimates were developed from Authority for Expenditure (AFE) data for directional wells in the study area and EIA estimates for horizontal wells. The percentages for the CBNG wells were based on a previous analysis conducted for the Wyoming Greater Sage-Grouse Land Use Plan Amendments/EIS.

The local spending figure (i.e., direct impact) per well was parsed into various industrial sectors of the IMPLAN model based on breakdowns of the different types of costs for drilling and completion (each

<sup>4</sup> These figures are for a "composite well" as defined for analysis purposes. The cost structure of a composite well is weighted by the expected ratio between vertical/directional wells and horizontal wells, as noted in the previous paragraph.

addressed separately) taken from various sources – mainly AFEs provided by industry and EIA estimates. The expenditure data was disaggregated across the following 14 IMPLAN sectors. Following standard regional economic analysis practices, expenditures in the wholesale trade sector were “marginized” (reduced to account for the cost of goods from outside the study area).<sup>5</sup>

<u>Number</u>	<u>Sector Name</u>
37	Drilling Oil and Gas Wells
38	Support Activities for Oil and Gas Operations
54	Power and Communication Structures
56	Highways and Streets
395	Wholesale Trade (margin of 17.3%)
411	Truck Transportation
427	Wired Telecommunications Carriers
438	Insurance
445	Commercial and Industrial Machinery and Equipment Rental and Leasing
447	Legal Services
448	Accounting
449	Architectural, Engineering, and Related Services
471	Waste Management Remediation Services
HH	Households (Contract Labor)

The IMPLAN model provided estimates of direct, indirect, and induced output, employment, and labor earnings. Induced impacts were reduced by 60% for sectors 37 and 38 to account for non-local workers involved with drilling and completion of oil and gas wells in Wyoming. This estimate was based on information provided by industry for previous oil and gas economic impact analyses in Wyoming and is consistent with Wyoming Department of Employment data.

Once the economic impacts per well were estimated for drilling and for completion, those figures were multiplied by the total number of wells drilled or completed. The resulting figures were then summed to yield the total impacts of the development stage by year.

## **Production Impacts**

The analyses for production utilized the oil and gas production volumes by year from the RFD scenario. The RFD provides projected production volumes for all wells. These volumes were adjusted to reflect production for only Bureau-managed wells by multiplying the all wells production by the ratio between Bureau-managed wells drilled and all wells drilled.

The production volume data was then multiplied by price estimates to estimate total annual sales value revenue streams for oil and gas production. The market prices for oil and gas were based on EIA 2016–2031 oil and gas price projections for the Dakotas/Rocky Mountain Region, using the average of the price projections for all those years, and expressed in 2014 dollars. These revenue streams were then entered into the IMPLAN model, Sector 20, Natural Gas and Crude Production, to estimate the total economic impacts from production.

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<sup>5</sup> Margin represents sales receipts less the cost of the goods sold.

Per unit ad valorem and severance tax revenues estimates were developed from per unit tax revenue rates from the Wyoming Department of Revenue's 2015 Annual Report. These estimated rates were applied to the forecasted market sales values, with the assumption that the Wyoming tax structure will remain constant over the analysis period. The estimates for Federal Mineral Royalties were based on the current total royalty rate of 12.5% of market value. Wyoming's share amounts to 6% of the market value; the Federal Government retains the remainder. Royalties do not include bonus bids (a one-time additional revenue source for some leases) or rents to the federal government, which are a very small revenue stream. Table N-2 summarizes the prices and revenue rate estimates used in the analysis.

**Table N-2. Prices and Tax Revenue Estimates for Oil and Gas Production**

	Oil (\$/BBL)	Gas (\$/MCF)
Market Price (1)	\$70.85	\$3.69
Ad Valorem Tax (2)	\$4.29	\$0.172
Severance Tax (2)	\$3.88	\$0.156
Federal Mineral Royalties, Federal Share	\$4.81	\$0.250
Federal Mineral Royalties, Wyoming Share (3)	\$4.05	\$0.211

BBL: Barrel; MCF: Million Cubic Feet

(1) Average EIA Dakota/Rocky Mountain Region 2016–2031 forecast (adjusted to 2014\$)

(2) Wyoming Department of Revenue 2015 Annual Report adjusted to market prices

(3) Assumes Wyoming's share is 6% of market value

## N.2.2 Coal

### Introduction

There is only one phase of economic activity for coal – the production phase. There is no development phase equivalent to the drilling and completion activities in the oil and gas industry.

The coal production economic analysis involved two major steps:

- Estimating the amounts of production on BLM-administered coal in the planning area under each management alternative.
- Estimating the economic impacts based on the value of production.

Average production from BLM-administered coal from 2007–2015 was used as the estimate of future production. This period showed variations in production from year to year. Variations are also likely in the future, so the average value was used. The BLM identified all federal coal leases in the RSFO and obtained production volumes (and sales values and royalties) for those leases for the applicable years from the U.S. Department of the Interior's Office of Natural Resources Revenue (ONRR). The RSFO minerals specialists determined that the current availability of coal on federal minerals could support similar rates of production through the planning period. Furthermore, the BLM determined that there are no differences between the management alternatives that would result in production volume differences that could be reliably quantified.

In the RSFO, coal is produced from both surface and underground sources. These sources have different cost structures and tax and royalty rates. Future production from each source was based on the average surface to underground production ratio for 2013–2015, applied to the estimate of future production described above.



The estimated production volumes were then multiplied by the price of coal, resulting in an estimate of the total annual sales value for coal production. The estimated future price was based on EIA 2016–2031 reference case projections for western Wyoming minemouth prices, using the average of the price projections for all those years, which was \$40.24, expressed in 2014 dollars. Some other sources provided higher prices, but these appeared to be prices for delivered coal, which is not the appropriate price for the impact analysis for the socioeconomic study area.

## **IMPLAN Model Modifications**

The IMPLAN modeling system utilizes national production coefficients. To better reflect local production practices, the coal sector (IMPLAN sector 22) was modified, using the following protocol. Total output for the coal sector was based on mine-level production quantities from the Wyoming State Inspector of Mines and price estimates for southwest Wyoming coal from private sector data sources. Employment estimates were based on Wyoming State Inspector of Mines mine level-data. Earnings were based on BLS data for Wyoming on covered employment. These estimates were adjusted to account for employer paid benefits using BEA data. Intermediate payments were scaled based on mine-level private sector data.

## **Coal Production Impacts**

The coal sales values were entered into the IMPLAN model, Sector 22, Coal Mining, to estimate the total economic impact from coal production. Public revenues were estimated by multiplying the sales value by the current federal mineral royalty rates (federal and state shares) and current ad valorem and severance tax rates. The ad valorem and severance tax analysis was adjusted by the Wyoming Department of Revenue assessed to gross ratios for coal production in Wyoming.

In Chapter 4, the economic impacts of coal production are reported together with the impacts of trona production. Adding these results together was necessary in order to avoid potential disclosure of proprietary information due to the small number of operators in each industry.

## **N.2.3 Trona (Soda Ash)**

### **Introduction**

There is only one phase of economic activity for trona – the production phase. There is no development phase equivalent to the development and completion activities in the oil and gas industry. However, there are two steps in production that are both encompassed in the analysis. First, trona is mined. Second, the vast majority of the trona ore is processed into soda ash, which is then sold and shipped to other industries. Some additional trona derivative products are also created and sold. These include purge liquor, sulfide, sodium bi-carbonate, and sodium sesquicarbonate. A small amount of trona ore is also sold separately. The value of these products is not included in the economic impact analysis. Together, they represent from 7.4 to 7.9% of the total sales value of all trona-derived products from Sweetwater County according to data from the ONRR.

All trona production in Wyoming occurs on federal and non-federal minerals in the Known Sodium Leasing Area (KSLA), which is entirely located within Sweetwater County. Not all of the federal trona resource in the KSLA is managed by the RSFO; some is managed by the Kemmerer Field Office. The economic impact analysis for the RSFO RMP only addresses production from federal minerals in the RSFO. The BLM identified all federal trona leases in the RSFO and obtained production volumes (and sales values and royalties) for those leases for the applicable years from the ONRR.

Average soda ash production from BLM-administered trona from 2007–2014 was used as the estimate of future production. This period showed variations in production from year to year. Variations are also likely

in the future, so the average value was used. The RSFO minerals specialists determined that the current availability of trona on federal minerals could support similar rates of production through the planning period. Furthermore, the BLM determined that there are no differences between the management alternatives that would result in production volume differences that could be reliably quantified.

The estimated soda ash production volume was then multiplied by the price of soda ash, resulting in an estimate of the total annual sales value for soda ash production. The 2014 Sweetwater County price of \$133.91 per ton from the Wyoming Department of Revenue was used as the estimated future price. This assumes that soda ash prices will remain, on average, constant through the duration of the study period.

## **IMPLAN Model Modifications**

The IMPLAN modeling system utilizes national production coefficients. To better reflect local production practices and the trona and soda ash industry specifically, the Potash, Soda, and Borate Minerals (Sector 33) and Other Basic Inorganic Chemical Manufacturing (Sector 164) sectors were modified, as follows. Total output for the two sectors was based on state-level production quantities from the Wyoming Department of Revenue. Prices for trona and soda ash were also based on Wyoming Department of Revenue data. Employment data for both sectors was based on Wyoming State Inspector of Mines data. Earnings for both sectors were based on BLS data for Wyoming on covered employment. These estimates were adjusted to account for employer-paid benefits using BEA data. Intermediate payments were scaled based on IMPLAN data for the respective sectors.

## **Trona (Soda Ash) Production Impacts**

The soda ash revenue was entered into the IMPLAN model, Sector 164, Other Basic Inorganic Chemical Manufacturing to estimate the total economic impact of soda ash production. The total economic impact of trona mining was estimated separately by entering trona mining revenue into the IMPLAN model, Sector 33, Potash, Soda, and Borate Minerals, after removing the linkage between Sector 164 and Sector 33 from the Sector 164 industry production account in the IMPLAN model. Removing the linkage eliminates double-counting the impacts from trona revenue.

## **N.2.4 Livestock Grazing**

### **Introduction**

The livestock grazing economic analysis involved three major steps:

- Estimating the amounts of forage utilized on BLM-administered lands in the planning area under each management alternative.
- Estimating the economic value of forage use.
- Estimating the economic impacts based on the value of production.

Each of these steps is described in detail below. There is only one “phase” of economic activity for livestock grazing – livestock production. There is no “development” phase equivalent to the drilling and completion activities in the oil and gas industry.

The analysis was based around cattle and sheep grazing, which were analyzed separately. Forage utilization for non-wild horses – a very small portion of total forage utilization – was excluded from the analysis. It was assumed that most forage utilization for horses occurs as support for ranching operations and thus is a cost of production. Therefore, forage utilization for horses is accounted for in the livestock operations budgets used in developing the value of production for marketable livestock. Further, there is no similar

commodity value for horses (they are not sold for slaughter for meat as cattle and sheep are). Forage for wild horses is not included in the forage utilization estimates discussed below. The BLM allocates forage for wildlife and wild horses separately.

## Estimation of Forage Utilization

The economic impact estimates for livestock grazing were based on: a) the 10-year average (2006–2015) of billed animal unit months (AUM), and b) total authorized AUMs of forage use for cattle, sheep, and other livestock for the RSFO. One AUM is equal to the amount of forage consumed by a cow and calf during a 1-month grazing period. Billed forage use is the closest available proxy for actual forage use. Because billed use may exceed actual grazing use, the economic analyses may overstate the actual economic impacts of grazing to some degree. Estimates were also prepared for total authorized forage use in order to indicate the maximum possible economic impact of grazing on BLM-administered land; however, billed use was considerably below authorized use for every year of the 2006–2015 period.

The total authorized AUMs are the same for Alternatives A and D. Total authorized AUMs are 6,202 less under Alternative B due to provisions of that management alternative (prohibition on grazing in certain allotments). Under Alternative C, total authorized AUMs are limited to the highest level of actual use (billed use) over the last 10 years (2009 – 2018). That figure is 160,387 AUMs, which is 142,881 less than the authorized AUMs under Alternatives A and D.

The billed use estimates did not vary between the alternatives. While forage utilization and billed use could vary somewhat under these alternatives (e.g., due to differences in treatment of voluntary relinquishment of permits or grazing preference), the differences between the alternatives could not be quantified for billed use. Also, while total authorized AUMs decrease in Alternatives B and C, total authorized AUMs are still greater than or equal to historical total billed use in the RSFO; therefore, the BLM believes that billed use would not be affected by the reduction in authorized AUMs under Alternatives B and C.

## Estimation of the Economic Value of Forage Use

The value of grazing in a specific area can be estimated based on the grazing use of the area in AUMs as described above, and the value of an AUM. The direct value of production per AUM was estimated based on regional livestock production value data and ratios in the livestock economics literature. According to Workman (1986), it takes 16 AUMs to produce a marketable cow. Thus, the average value of an AUM can be estimated using data on the value of cattle production per bred cow and dividing by 16. A similar procedure can be used to estimate the value of an AUM used for sheep production, using 3.2 AUMs per ewe. In addition, a cow-calf operation adjustment is made by multiplying the value by 1.2 (National Agricultural Statistic Service 2015). This adjustment is made to convert from an animal unit basis to a cow-calf basis since billed AUMs do not count livestock under six months of age. In Wyoming, most livestock operators run cow-calf operations. The ewe-lamb operation adjustment is assumed to be the same.

The value per AUM for cattle was based on a 5-year average (2010–2014) of the annual value of production per bred cow estimates from the United States Department of Agriculture (USDA) Economic Research Service's (ERS) Commodity Cow-Calf Costs and Returns estimates for the Basin and Range portion of the United States. 2014 was latest year the ERS data was available. BLM used five years of data to avoid skewed values during the early years (2008–2009) of the Great Recession. The methodology and data for calculation of the average value of cattle production from one AUM of forage are shown in Table N-3. The IMPLAN inflator adjusts the nominal dollar values for value of production to constant 2014 dollars. The cow-calf adjustment factor converts generic AUMs to cow-calf AUMs. In Wyoming, most cattle operations are cow-calf operations.

The direct value of production for sheep was based on estimated gross receipts per ewe from the University of Wyoming's most recent (2014) Wyoming Range Sheep Budget (Fuez 2014). The methodology and data for this calculation are shown in Table N-4.

The figures for the value per AUM for cattle or sheep grazing were multiplied by the number of AUMs under each alternative. The result was the total economic value of livestock production, which was used as the direct impact input to the IMPLAN model.

**Table N-3. Value of an AUM for Cattle Production, Basin and Range Region**

Year	Value of Production Per Bred Cow <sup>1</sup>	AUMs Per Cow <sup>2</sup>	Value of Production Per AUM	IMPLAN Inflator	Inflated Value of Production Per AUM*	Cow-Calf Adjustment <sup>3</sup>	Adjusted Value of Production per AUM
2010	\$570.50	16	\$35.66	0.690	\$51.68	1.20	\$62.01
2011	\$648.59	16	\$40.54	0.720	\$56.30	1.20	\$67.56
2012	\$744.93	16	\$46.56	0.935	\$49.79	1.20	\$59.75
2013	\$780.50	16	\$48.78	0.985	\$49.52	1.20	\$59.43
2014	\$1,076.00	16	\$67.25	1.000	\$67.25	1.20	\$80.70
<b>5-year Average</b>							<b>\$65.89</b>

<sup>1</sup> USDA ERS, Commodity Costs and Returns, data for Basin and Range region, cow-calf pair, <http://www.ers.usda.gov/data-products/commodity-costs-and-returns.aspx>.

<sup>2</sup> Workman 1986.

<sup>3</sup> National Agricultural Statistical Service 2015.

\*Value times inflator.

**Table N-4. Value of an AUM for Sheep Production**

Year	Value of Production Per Ewe <sup>1</sup>	AUMs Per Ewe (1/5) <sup>2</sup>	Value of Production Per AUM	IMPLAN Inflator	Inflated Value of Production Per AUM*	Ewe-Lamb Adjustment <sup>3</sup>	Adjusted Value of Production per AUM
2014	\$148.76	3.2	\$46.49	1.000	\$46.49	1.20	\$55.79

<sup>1</sup> University of Wyoming, Wyoming Range Sheep Budget, 1,000 Ewes - Selling Lambs in Fall (Feuz 2015).

<sup>2</sup> Assumes five sheep = one cow.

<sup>3</sup> Assumed to be the same as Cow-Calf Adjustment.

\*Value times inflator.

## IMPLAN Model Modifications

The value-added components of the All Other Crop Farming sector (sector 10) in IMPLAN were modified to better reflect hay production in the study area. The modifications were based on a grass hay budget for western Colorado from the Colorado State University (Sharp 2011).

## Livestock Production Impacts

The economic impacts of livestock grazing were estimated in IMPLAN using analysis-by-parts methodology. The total value of production from the steps described above was allocated to different IMPLAN sectors based on a 2014 cattle production budget from the University of Idaho (Painter and Rimbey 2014) and a University of Wyoming range sheep budget (Fuez 2014).

The value of production was disaggregated across 14 IMPLAN sectors. Following standard regional economic analysis practices, expenditures in wholesale and retail trade (food and beverage store) sectors were “marginized” (reduced to account for the cost of goods from outside the study area).<sup>6</sup>

<u>Number</u>	<u>Sector Name</u>
2	Grain Farming
10	All Other Crop Farming
11	Cattle Ranching and Farming
14	Animal Production, Except Cattle, Poultry, and Eggs
19	Support Activities for Agriculture and Forestry
63	Maintenance and Repair Construction of Residential Structures
395	Wholesale Trade (margin of 17.3%)
400	Food and Beverage Stores (margin of 34.6%)
411	Truck Transportation
433	Monetary Authorities and Depository Credit Intermediation
440	Real Estate
448	Accounting, Tax Preparation, Bookkeeping
459	Veterinary Services
507	Commercial and Industrial Machinery and Equipment Repair

## N.2.5 Recreation

### Introduction

The tables for the recreation economic analysis present two views of the economic effects of recreation. Economic impact measures only the effects of “new” income in the study area; in the case of recreation, economic impact is based on all spending of non-local residents on local recreation, and the spending by local residents that would be lost to other regions if the local BLM recreational opportunity did not exist (some spending by local residents would continue, using local substitute recreation opportunities). Economic contribution includes the effects of all expenditures made by local residents (roughly, individuals who live within the socioeconomic study area), as well as the role of spending from recreators from outside the study area. In other words, economic contribution is based on all spending of local residents on local recreation and all spending of non-local residents on local recreation. Economic impact is the measure used in the analyses above of oil and gas development and production, coal production, trona (soda ash) production, and livestock grazing. Local residents buy only a very small proportion of the total output of those industries, so a measure of economic contribution would be only slightly greater than the measure of economic impact. In the case of recreation, however, local residents make considerable recreation-related expenditures (gas, food, and so on while on local trips), so it is fair to include those expenditures in an analysis of the economic role of recreation. Put another way, expenditures by local and non-local recreationists alike help keep local businesses going.

### Estimation of Recreation Usage

Recreation visitation estimates for the RSFO were taken from the BLM’s Recreation Management Information System (RMIS). Recreation usage data is expressed in “visits.” A visit is defined as one individual who enters and recreates on BLM-administered land for an indeterminate period of time. A visit

<sup>6</sup> Margin represents sales receipts less the cost of the goods sold.

ends when that individual spends a night off the BLM unit. The fact that some visits are of a single day or less, and some are for multiple days, is accounted for in the approach to estimating the direct impacts (expenditures) of visitors, as discussed below. Table N-5 shows the total visits in the RSFO in recent years.

**Table N-5. Total Recreation Visits to the RSFO, 2011–2015**

Fiscal Year	Visits
2011	429,861
2012	426,439
2013	452,916
2014	518,082
2015	847,318
Five-Year Average	534,923
Low Year Visits	426,439
High Year Visits	847,318

Source: RMIS data

While visitation in the RSFO has increased in recent years, it is unknown if this trend will continue. Therefore, the BLM conducted two economic analyses, for high and low visitation scenarios. The low scenario assumes that visitation over the 2016–2031 study period would average out as the low year visits number (426,439) and the high visitation scenario assumes that visitation would average out to the high year visits number (847,318).

While the alternatives differ in terms of recreation management actions, there is no basis for reliably estimating how the management actions will affect recreation visitation numbers. In Alternative C, a new open play area would be added. There is no basis for confidently predicting the amount of visitation the new play area would draw. Therefore, the total low and high scenario visitation numbers for Alternative C is the same as for Alternative A; however, it is likely there would be some additional visitation and economic activity under Alternative C. Alternative D retains the Killpecker Sand Dunes OHV play area and does not add a new open play area; therefore, it is likely that visitation and economic impacts of recreation in Alternative D would be the same as Alternative A.

### Estimation of the Direct Economic Impacts of Recreation

Due to the lack of recreation expenditure data for the RSFO, data from the National Visitor Use Monitoring (NVUM) program of the U.S. Forest Service (USFS) were used to estimate the economic effects of recreation for the RSFO. The NVUM program provides a robust data source that is widely used for recreation economic impact analysis for areas besides USFS-managed lands. This is done by identifying national forest units that are reasonably analogous to another recreation management area and applying the recreational expenditure data from NVUM to other area-specific recreation use data or estimates.

The USFS unit deemed most analogous to the RSFO in terms of recreation use was the Ashley National Forest, which partially overlaps the southern portion of the RSFO. The BLM used recreation market segment data and expenditure profiles for the Ashley National Forest from the latest iteration, Round 3, of the NVUM surveys (White 2016a). However, while the BLM used several components of the NVUM data for the Ashley National Forest, the NVUM recreation “trip type” data for the national forest were replaced by analogous estimates for the RSFO developed by a RSFO recreation specialist. This is because the RSFO tends to get more non-local visitation than the Ashley National Forest. The Flaming Gorge Reservoir,

located on the national forest and not part of the RSFO, sees significant local use, while the “brand” of recreation on the RSFO is more remote, which attracts a higher proportion of non-local visitors. Also, due to the great distances involved in travelling to recreation sites in the RSFO, local visitors were considered to be people who live in the area and could be traveling to a site from as far away as 75 miles.

The NVUM recreation segment and expenditure data were applied to the RSFO as described below. All NVUM expenditures as applied to the RSFO were assumed to be local expenditures (within the socioeconomic study area), based on how the NVUM data was collected (surveys asked interviewees for their expenses within 50 miles of the recreation site).

- The allocation of RSFO visitation to two overarching NVUM “broad visit activity” types was assumed to equal the allocation for the Ashley National Forest of 39.6% to wildlife-related recreation and 60.4% to all other recreation. These values were applied to the total low and high scenario visit numbers.<sup>7</sup>
- A RSFO recreation specialist estimated, based on familiarity with visitation patterns in the field office, the percentage of the visits to each RSFO recreation site in RMIS that fell into each of seven different recreation “trip types” utilized in the NVUM. This evaluation was done for FY2013 visitation, which was deemed sufficiently representative for the overall analysis. When summed and divided into the total visitation, the overall trip type percentages were as shown in Table N-6.
- The trip type percentages were applied to the number of wildlife-related visits and the number of other recreation visits under each of the two visitation scenarios.
- The estimates of visits by trip type for each broad visit activity type were then converted to party visits based on average party size data for each trip type from the NVUM.
- Total party visits were multiplied by party spending figures from the NVUM for each broad visit activity type and trip type to estimate direct spending by visitors. The party spending figures from NVUM were the averages for a “low-expenditure forest,” which is the forest expenditure profile applicable to the Ashley National Forest. The NVUM researchers have determined that expenditure figures based on averages across multiple forests are more reliable than individual forest expenditures.
- Total direct spending across all broad visit activity types and visit types was summed to yield the total direct economic contribution estimates.
- Total direct spending was adjusted (reduced) for the local trip segments to reflect estimated out-of-area substitution, based on NVUM national data (White and Stynes 2010). The remaining direct spending across all segments was then summed to yield the total direct economic impact estimates.

**Table N-6. Overall Trip Type Percentages**

Day	Non-Local Visitor		Day	Local Visitor		Non-Primary Visit*
	Overnight on BLM	Overnight off BLM		Overnight on BLM	Overnight off BLM	
39.7%	18.3%	4.6%	22.9%	8.8%	1.2%	4.5%

\*E.g., just passing by on I-80.

Source: Review of FY2013 BLM RMIS data by RSFO recreation specialist

<sup>7</sup> Note: The use of broad visit activity types is new to NVUM Round 3. It was not used by the Forest Service in the NVUM Round 2 data used by the BLM for the Wyoming Greater Sage-Grouse Proposed Land Use Plan Amendment and Final Environmental Impact Statement, dated May 2015. Thus, the expenditure figures by segment differ between this analysis and the Greater Sage-Grouse analysis.

Attachment 1 to this appendix illustrates calculation of direct economic contribution and direct economic impact using the procedure above.

The BLM acknowledges that certain recreation activities on BLM-administered land may generate visitor expenditure patterns that differ from the NVUM expenditure values. However, the BLM believes that in total – averaged across the many different recreation activities that take place in the RSFO – the per visit expenditure values from the NVUM are reasonably close to the per visit expenditures that occur in the socioeconomic study area due to recreation on BLM-administered land in the RSFO.

One recreation activity that has received considerable attention in terms of its economic impact is OHV riding. Some OHV advocacy groups maintain that OHV riders have different spending profiles from other recreationists and claim that OHV use contributes more to the local recreation economy. However, expenditure values from the literature addressing OHV riding are sometimes not comparable to each other, and the values for the most relevant OHV studies for this RMP/EIS are not comparable to the methodology used in the NVUM. For instance, OHV recreationist expenditures have been estimated in studies in Wyoming by Nagler et al. (2013) and Foulke et al. (2006), and in Idaho by Anderson and Taylor (2014). Based on survey data, Nagler et al. (2013) report that average trip expenditures per person per day for OHV trips in Wyoming in 2012 were \$40.54 for Wyoming residents and \$60.61 for non-residents. NVUM data, on the other hand, are by design focused on identifying variations in spending for the seven different trip types noted above. While the NVUM program gathers data on activity types, this has never been a focus of the program. In addition, NVUM data are gathered and presented on the basis of spending for each party (one or more people) for each trip, not spending per person per day. Nonetheless, NVUM researchers have looked at spending across different types of activities identified by the survey respondents as the primary purpose of the trip. Stynes and White (2006) report that for trips where OHV use is the primary activity, expenditures per party per trip for National Forests with an average expenditure profile were, in 2003 dollars, \$60 for non-local day trips, \$162 for non-local overnight trips (one or more nights), \$38 for local day trips, and \$97 for local overnight trips. These data reflect parties that are mostly comprised of more than one person, and the overnight trips typically represent more than one day of activity. These figures cannot be readily converted and compared to the expenditure basis used in the OHV-specific studies cited above. However, it should be noted that these figures are not among the highest figures for the various activities in the NVUM data. The corresponding figures across all activity types for the same set of average expenditure forests were \$52 for non-local day trips, \$208 for non-local overnight trips, \$33 for local day trips, and \$121 for local overnight trips. In short, the expenditures for OHV trips are slightly higher than the all-activity types average for day trips, and lower for overnight trips.

For this RMP/EIS, the BLM has chosen an expenditure data source (NVUM) and methodology that provide a consistent analysis across all activity types. This approach is also consistent with most BLM RMP/EISs. Where appropriate, impacts of management actions on different types of recreation are addressed qualitatively.

### **IMPLAN Model Modifications**

No modifications were made to the IMPLAN model for recreation-related sectors. The coefficients used by the model for these sectors are generally considered reliable for Wyoming.

### **Recreation Impacts**

As noted earlier, the economic importance of recreation in the RSFO was considered both in terms of “economic contribution” which is a descriptive analysis that simply tracks the gross economic activity as the dollars cycle through the region’s economy and “economic impact” which estimates the net economic activity that would be lost from the local economy without the resource. The total direct economic



contributions or impacts that were developed as described above were used in the IMPLAN model to estimate the indirect, induced, and total economic effects of recreation.

The total direct economic contributions or impacts were entered into the IMPLAN model using distributions of expenditures by trip type to different recreation-affected industries. These distributions were developed by the USFS from the NVUM surveys. Specifically, the direct recreation spending was disaggregated across the following 10 IMPLAN sectors based on the spending distributions from NVUM (White 2016b). Following standard regional economic analysis practices, expenditures in retail trade sectors were “margined” (reduced to account for the cost of goods from outside the study area).<sup>8</sup>

<u>Number</u>	<u>Sector Name</u>
400	Retail – Food and Beverages (margin of 34.6%)
402	Retail – Gasoline Stations (margin of 11.6%)
404	Retail – Sporting Goods, Hobby, Book, Music (margin of 41.7%)
406	Retail – Miscellaneous (margin of 47.2%)
442	Automotive Equipment Rental and Leasing
493	Museums, Historical Sites, Zoos, and Parks
496	Other Amusement and Recreation Industries
499	Hotels and Motels
500	Other Accommodations
501	Full-Service Restaurants

## N.2.6 Nonmarket Values

The analysis of nonmarket values for this RMP/EIS was partly quantitative and partly qualitative. Nonmarket values (consumer surplus value) associated with recreation were estimated quantitatively at a high level using a benefits transfer methodology described in Chapter 4 of the RMP/EIS. Total visitor days for the RSFO were taken directly from RMIS. Other nonmarket values and variations in nonmarket values across the alternatives were discussed qualitatively in Chapter 4.

## N.3 SUMMARY OF THE QUANTITATIVE ECONOMIC IMPACT ANALYSIS

This section presents multiple tables that allow for easy comparison of the quantitative economic impact results across the alternatives.

**Table N-7. Total Economic Output by Program by Alternative (1,000s of 2014\$)**

	Alt. A	Alt. B	Alt. C	Alt. D
<b>Annual Impact, 2016</b>				
Livestock Grazing (Billed Use) <sup>1</sup>	\$13,040	\$13,040	\$13,040	\$13,040
Oil and Gas Development <sup>1</sup>	\$695,742	\$185,507	\$715,565	\$689,474
Oil and Gas Production <sup>2</sup>	\$539,946	\$143,052	\$555,061	\$534,599
Coal and Soda Ash Production <sup>1,3</sup>	\$449,698	\$449,698	\$449,698	\$449,698

<sup>8</sup> Margin represents sales receipts less the cost of the goods sold.

	Alt. A	Alt. B	Alt. C	Alt. D
Recreation (High Visitation) <sup>1</sup>	\$36,065	\$36,065	\$36,065	\$36,065
Total BLM-Supported	\$1,734,491	\$827,362	\$1,769,429	\$1,722,876
<b>Net Present Value, 2016–2031 (3% Discount Rate)</b>				
Livestock Grazing (Billed Use) <sup>1</sup>	\$163,791	\$163,791	\$163,791	\$163,791
Oil and Gas Development <sup>1</sup>	\$8,739,289	\$2,330,173	\$8,988,281	\$8,660,550
Oil and Gas Production <sup>1,3</sup>	\$14,940,326	\$3,960,300	\$15,359,591	\$14,793,106
Coal and Soda Ash Production <sup>1,3</sup>	\$5,648,698	\$5,648,698	\$5,648,698	\$5,648,698
Recreation (High Visitation) <sup>1</sup>	\$453,010	\$453,010	\$453,010	\$453,010
Total BLM-Supported	\$29,945,115	\$12,555,972	\$30,613,372	\$29,719,155
<b>Net Present Value, 2016–2031 (7% Discount Rate)</b>				
Livestock Grazing (Billed Use) <sup>1</sup>	\$123,180	\$123,180	\$123,180	\$123,180
Oil and Gas Development <sup>1</sup>	\$6,572,432	\$1,752,420	\$6,759,688	\$6,513,216
Oil and Gas Production <sup>4</sup>	\$10,465,623	\$2,774,094	\$10,759,277	\$10,362,469
Coal and Soda Ash Production <sup>1,3</sup>	\$4,248,136	\$4,248,136	\$4,248,136	\$4,248,136
Recreation (High Visitation) <sup>1</sup>	\$340,689	\$340,689	\$340,689	\$340,689
Total BLM-Supported	\$21,750,061	\$9,238,518	\$22,230,970	\$21,587,689

<sup>1</sup> Assumes constant annual activity level (based on available data).

<sup>2</sup> Would rise each year from 2016 due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

<sup>4</sup> Incorporates annual increases in production.

**Table N-8. Total Economic Output, Alternative Scenarios for Grazing and Recreation, by Alternative (1,000s of 2014\$)**

	Alt. A	Alt. B	Alt. C	Alt. D
<b>Annual Impact, 2016</b>				
Livestock Grazing (Total Authorized Use) <sup>1</sup>	\$25,825	\$25,251	\$13,658	\$25,825
Recreation (Economic Impact – Low Visitation) <sup>1</sup>	\$18,151	\$18,151	\$18,151	\$18,151
Recreation (Economic Contribution – Low Visitation) <sup>1</sup>	\$21,465	\$21,465	\$21,465	\$21,465
Recreation (Economic Contribution – High Visitation) <sup>1</sup>	\$42,573	\$42,573	\$42,573	\$42,573
<b>Net Present Value, 2016–2031 (3% Discount Rate)</b>				
Livestock Grazing (Total Authorized Use) <sup>1</sup>	\$324,394	\$317,179	\$171,558	\$324,394
Recreation (Economic Impact – Low Visitation) <sup>1</sup>	\$227,991	\$227,991	\$227,991	\$227,991
Recreation (Economic Contribution – Low Visitation) <sup>1</sup>	\$269,621	\$269,621	\$269,621	\$269,621
Recreation (Economic Contribution – High Visitation) <sup>1</sup>	\$534,761	\$534,761	\$534,761	\$534,761
<b>Net Present Value, 2016–2031 (7% Discount Rate)</b>				
Livestock Grazing (Total Authorized Use) <sup>1</sup>	\$243,962	\$238,536	\$129,021	\$243,962
Recreation (Economic Impact – Low Visitation) <sup>1</sup>	\$171,462	\$171,462	\$171,462	\$171,462
Recreation (Economic Contribution – Low Visitation) <sup>1</sup>	\$202,770	\$202,770	\$202,770	\$202,770
Recreation (Economic Contribution – High Visitation) <sup>1</sup>	\$402,170	\$402,170	\$402,170	\$402,170

<sup>1</sup> Assumes constant annual activity level (based on available data).

**Table N-9. Total Labor Earnings by Program by Alternative (1,000s of 2014\$)**

	Alt. A	Alt. B	Alt. C	Alt. D
<b>Annual Impact, 2016</b>				
Livestock Grazing (Billed Use) <sup>1</sup>	\$4,471	\$4,471	\$4,471	\$4,471
Oil and Gas Development <sup>1</sup>	\$244,953	\$65,310	\$251,931	\$242,746
Oil and Gas Production <sup>2</sup>	\$43,369	\$11,490	\$44,583	\$42,940
Coal and Soda Ash Production <sup>1,3</sup>	\$78,720	\$78,720	\$78,720	\$78,720
Recreation (High Visitation) <sup>1</sup>	\$7,824	\$7,824	\$7,824	\$7,824
Total BLM-Supported	\$379,338	\$167,816	\$387,529	\$376,701
<b>Net Present Value, 2016–2031 (3% Discount Rate)</b>				
Livestock Grazing (Billed Use) <sup>1</sup>	\$56,161	\$56,161	\$56,161	\$56,161
Oil and Gas Development <sup>1</sup>	\$3,076,884	\$820,368	\$3,164,534	\$3,049,152
Oil and Gas Production <sup>4</sup>	\$1,200,026	\$318,096	\$1,233,701	\$1,188,201
Coal and Soda Ash Production <sup>1,3</sup>	\$988,809	\$988,809	\$988,809	\$988,809
Recreation (High Visitation) <sup>1</sup>	\$98,284	\$98,284	\$98,284	\$98,284
Total BLM-Supported	\$5,420,164	\$2,281,719	\$5,541,489	\$5,380,607
<b>Net Present Value, 2016–2031 (7% Discount Rate)</b>				
Livestock Grazing (Billed Use) <sup>1</sup>	\$42,236	\$42,236	\$42,236	\$42,236
Oil and Gas Development <sup>1</sup>	\$2,313,988	\$616,962	\$2,379,906	\$2,293,132
Oil and Gas Production <sup>4</sup>	\$840,612	\$222,819	\$864,199	\$832,326
Coal and Soda Ash Production <sup>1,3</sup>	\$743,639	\$743,639	\$743,639	\$743,639
Recreation (High Visitation) <sup>1</sup>	\$73,915	\$73,915	\$73,915	\$73,915
Total BLM-Supported	\$4,014,391	\$1,699,571	\$4,103,895	\$3,985,249

<sup>1</sup> Assumes constant annual activity level (based on available data).

<sup>2</sup> Would rise each year from 2016 due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

<sup>4</sup> Incorporates annual increases in production.

**Table N-10. Total Labor Earnings, Alternative Scenarios for Grazing and Recreation, by Alternative (1,000s of 2014\$)**

	Alt. A	Alt. B	Alt. C	Alt. D
<b>Annual Impact, 2016</b>				
Livestock Grazing (Total Permitted Use) <sup>1</sup>	\$9,083	\$8,895	\$4,803	\$9,083
Recreation (Economic Impact – Low Visitation) <sup>1</sup>	\$3,938	\$3,938	\$3,938	\$3,938
Recreation (Economic Contribution – Low Visitation) <sup>1</sup>	\$4,679	\$4,679	\$4,679	\$4,679
Recreation (Economic Contribution – High Visitation) <sup>1</sup>	\$9,082	\$9,082	\$9,082	\$9,082
<b>Net Present Value, 2016–2031 (3% Discount Rate)</b>				
Livestock Grazing (Total Permitted Use) <sup>1</sup>	\$114,089	\$111,725	\$60,337	\$114,089
Recreation (Economic Impact – Low Visitation) <sup>1</sup>	\$49,465	\$49,465	\$49,465	\$49,465

	Alt. A	Alt. B	Alt. C	Alt. D
Recreation (Economic Contribution – Low Visitation) <sup>1</sup>	\$58,776	\$58,776	\$58,776	\$58,776
Recreation (Economic Contribution – High Visitation) <sup>1</sup>	\$114,085	\$114,085	\$114,085	\$114,085
<b>Net Present Value, 2016–2031 (7% Discount Rate)</b>				
Livestock Grazing (Total Permitted Use) <sup>1</sup>	\$85,802	\$84,024	\$45,377	\$85,802
Recreation (Economic Impact – Low Visitation) <sup>1</sup>	\$37,200	\$37,200	\$37,200	\$37,200
Recreation (Economic Contribution – Low Visitation) <sup>1</sup>	\$44,203	\$44,203	\$44,203	\$44,203
Recreation (Economic Contribution – High Visitation) <sup>1</sup>	\$85,799	\$85,799	\$85,799	\$85,799

<sup>1</sup> Assumes constant annual activity level (based on available data).

**Table N-11. Total Employment by Program by Alternative**

	Alt. A	Alt. B	Alt. C	Alt. D
<b>Annual Impact, 2016</b>				
Livestock Grazing (Billed Use) <sup>1</sup>	133	133	133	133
Oil and Gas Development <sup>1</sup>	3,436	917	3,534	3,405
Oil and Gas Production <sup>2</sup>	545	144	561	540
Coal and Soda Ash Production <sup>1,3</sup>	997	997	997	997
Recreation (High Visitation) <sup>1</sup>	324	324	324	324
Total BLM-Supported	5,435	2,515	5,549	5,399

<sup>1</sup> Assumes constant annual activity level (based on available data).

<sup>2</sup> Would rise each year from 2016 due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

Net present value is not applicable for employment.

**Table N-12. Total Employment, Alternative Scenarios for Grazing and Recreation, by Alternative**

	Alt. A	Alt. B	Alt. C	Alt. D
<b>Annual Impact, 2016</b>				
Livestock Grazing (Total Permitted Use) <sup>1</sup>	273	268	145	273
Recreation (Economic Impact – Low Visitation) <sup>1</sup>	163	163	163	163
Recreation (Economic Contribution – Low Visitation) <sup>1</sup>	194	194	194	194
Recreation (Economic Contribution – High Visitation) <sup>1</sup>	373	373	373	373

<sup>1</sup> Assumes constant annual activity level (based on available data).

Net present value is not applicable for employment.

## N.4 QUANTIFIED ECONOMIC IMPACTS

This section presents multiple tables that summarize the economic and fiscal impacts for each alternative.

**Table N-13. Total Annual Impacts by Program, 2016, Alternative A (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$7,094	\$561,074	\$450,660	\$283,578	\$29,279	\$1,331,685
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Total Economic Output	\$13,040	\$695,742	\$539,946	\$449,698	\$36,065	\$1,734,491
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Total Labor Earnings	\$4,471	\$244,953	\$43,369	\$78,720	\$7,824	\$379,338
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Jobs	133	3,436	545	997	324	5,435
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Ad Valorem Taxes	N.A.	N.A.	\$23,069	\$9,271	N.A.	\$32,340
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Severance Taxes	N.A.	N.A.	\$20,846	\$6,941	N.A.	\$27,787
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
FMR (Federal Share)	N.A.	N.A.	\$30,589	\$12,104	N.A.	\$42,693
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
FMR (WY Share)	N.A.	N.A.	\$25,744	\$10,187	N.A.	\$35,931
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Initial values; these would increase each year from 2016 due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties

**Table N-14. Net Present Value (3% Discount Rate) by Program, 2016–2031, Alternative A (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$89,114	\$7,047,714	\$12,469,766	\$3,562,057	\$367,775	\$23,536,426
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Total Economic Output	\$163,791	\$8,739,289	\$14,940,326	\$5,648,698	\$453,010	\$29,945,115
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Total Labor Earnings	\$56,161	\$3,076,884	\$1,200,026	\$988,809	\$98,284	\$5,420,164
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Average Jobs Per Year	133	3,436	1,267	997	324	6,157
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Ad Valorem Taxes	N.A.	N.A.	\$637,678	\$116,457	N.A.	\$754,135
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Severance Taxes	N.A.	N.A.	\$576,215	\$87,183	N.A.	\$663,398
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
FMR (Federal Share)	N.A.	N.A.	\$846,385	\$152,042	N.A.	\$998,427
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
FMR (WY Share)	N.A.	N.A.	\$712,335	\$127,962	N.A.	\$840,297
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Incorporates annual increases in production due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties

**Table N-15. Net Present Value (7% Discount Rate) by Program, 2016–2031, Alternative A (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$67,019	\$5,300,274	\$8,735,008	\$2,678,866	\$276,587	\$17,057,754

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Total Economic Output	\$123,180	\$6,572,432	\$10,465,623	\$4,248,136	\$340,689	\$21,750,061
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Total Labor Earnings	\$42,236	\$2,313,988	\$840,612	\$743,639	\$73,915	\$4,014,391
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Average Jobs Per Year	133	3,436	1,267	997	324	6,157
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Ad Valorem Taxes	N.A.	N.A.	\$446,735	\$87,582	N.A.	\$534,317
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Severance Taxes	N.A.	N.A.	\$403,676	\$65,567	N.A.	\$469,243
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
FMR (Federal Share)	N.A.	N.A.	\$592,889	\$114,344	N.A.	\$707,233
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
FMR (WY Share)	N.A.	N.A.	\$498,987	\$96,234	N.A.	\$595,221
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Incorporates annual increases in production due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties

**Table N-16. Total Annual Impacts by Program, 2016, Alternative B (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$7,094	\$149,581	\$119,397	\$283,578	\$29,279	\$588,929
% Difference from Alt. A	0.0%	-73.3%	-73.5%	0.0%	0.0%	-55.8%
Total Economic Output	\$13,040	\$185,507	\$143,052	\$449,698	\$36,065	\$827,362

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
% Difference from Alt. A	0.0%	-73.3%	-73.5%	0.0%	0.0%	-52.3%
Total Labor Earnings	\$4,471	\$65,310	\$11,490	\$78,720	\$7,824	\$167,816
% Difference from Alt. A	0.0%	-73.3%	-73.5%	0.0%	0.0%	-55.8%
Jobs	133	917	144	997	324	2,515
% Difference from Alt. A	0.0%	-73.3%	-73.5%	0.0%	0.0%	-53.7%
Ad Valorem Taxes	N.A.	N.A.	\$6,112	\$9,271	N.A.	\$15,383
% Difference from Alt. A	N.A.	N.A.	-73.5%	0.0%	N.A.	-52.4%
Severance Taxes	N.A.	N.A.	\$5,523	\$6,941	N.A.	\$12,464
% Difference from Alt. A	N.A.	N.A.	-73.5%	0.0%	N.A.	-55.1%
FMR (Federal Share)	N.A.	N.A.	\$8,104	\$12,104	N.A.	\$20,208
% Difference from Alt. A	N.A.	N.A.	-73.5%	0.0%	N.A.	-52.7%
FMR (WY Share)	N.A.	N.A.	\$6,821	\$10,187	N.A.	\$17,008
% Difference from Alt. A	N.A.	N.A.	-73.5%	0.0%	N.A.	-52.7%

<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Initial values; these would increase each year from 2016 due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties

**Table N-17. Net Present Value (3% Discount Rate) by Program, 2016–2031, Alternative B (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$89,114	\$1,878,902	\$3,305,418	\$3,562,057	\$367,775	\$9,203,266
% Difference from Alt. A	0.0%	-73.3%	-73.5%	0.0%	0.0%	-60.9%
Total Economic Output	\$163,791	\$2,330,173	\$3,960,300	\$5,648,698	\$453,010	\$12,555,972
% Difference from Alt. A	0.0%	-73.3%	-73.5%	0.0%	0.0%	-58.1%
Total Labor Earnings	\$56,161	\$820,368	\$318,096	\$988,809	\$98,284	\$2,281,719



	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
% Difference from Alt. A	0.0%	-73.3%	-73.5%	0.0%	0.0%	-57.9%
Average Jobs Per Year	133	917	336	997	324.0	2,707
% Difference from Alt. A	0.0%	-73.3%	-73.5%	0.0%	0.0%	-56.0%
Ad Valorem Taxes	N.A.	N.A.	\$169,019	\$116,457	N.A.	\$285,476
% Difference from Alt. A	N.A.	N.A.	-73.5%	0.0%	N.A.	-62.1%
Severance Taxes	N.A.	N.A.	\$152,728	\$87,183	N.A.	\$239,911
% Difference from Alt. A	N.A.	N.A.	-73.5%	0.0%	N.A.	-63.8%
FMR (Federal Share)	N.A.	N.A.	\$224,355	\$152,042	N.A.	\$376,397
% Difference from Alt. A	N.A.	N.A.	-73.5%	0.0%	N.A.	-62.3%
FMR (WY Share)	N.A.	N.A.	\$188,822	\$127,962	N.A.	\$316,784
% Difference from Alt. A	N.A.	N.A.	-73.5%	0.0%	N.A.	-62.3%

<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Incorporates annual increases in production due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties

**Table N-18. Net Present Value (7% Discount Rate) by Program, 2016–2031, Alternative B (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$67,019	\$1,413,039	\$2,315,364	\$2,678,866	\$276,587	\$6,750,876
% Difference from Alt. A	0.0%	-73.3%	-73.5%	0.0%	0.0%	-60.4%
Total Economic Output	\$123,180	\$1,752,420	\$2,774,094	\$4,248,136	\$340,689	\$9,238,518
% Difference from Alt. A	0.0%	-73.3%	-73.5%	0.0%	0.0%	-57.5%
Total Labor Earnings	\$42,236	\$616,962	\$222,819	\$743,639	\$73,915	\$1,699,571
% Difference from Alt. A	0.0%	-73.3%	-73.5%	0.0%	0.0%	-57.7%
Average Jobs Per Year	133	917	336	997	324.0	2,707

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
% Difference from Alt. A	N.A.	-73.3%	-73.5%	0.0%	0.0%	-56.0%
Ad Valorem Taxes	N.A.	N.A.	\$118,406	\$87,582	N.A.	\$205,988
% Difference from Alt. A	N.A.	N.A.	-73.5%	0.0%	N.A.	-61.4%
Severance Taxes	N.A.	N.A.	\$106,993	\$65,567	N.A.	\$172,560
% Difference from Alt. A	N.A.	N.A.	-73.5%	0.0%	N.A.	-63.2%
FMR (Federal Share)	N.A.	N.A.	\$157,155	\$114,344	N.A.	\$271,499
% Difference from Alt. A	N.A.	N.A.	-73.5%	0.0%	N.A.	-61.6%
FMR (WY Share)	N.A.	N.A.	\$132,265	\$96,234	N.A.	\$228,499
% Difference from Alt. A	N.A.	N.A.	-73.5%	0.0%	N.A.	-61.6%

<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Incorporates annual increases in production due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties

**Table N-19. Total Annual Impacts by Program, 2016, Alternative C (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$7,094	\$577,050	\$463,275	\$283,578	\$29,279	\$1,360,276
% Difference from Alt. A	0.0%	2.8%	2.8%	0.0%	0.0%	2.1%
Total Economic Output	\$13,040	\$715,565	\$555,061	\$449,698	\$36,065	\$1,769,429
% Difference from Alt. A	0.0%	2.8%	2.8%	0.0%	0.0%	2.0%
Total Labor Earnings	\$4,471	\$251,931	\$44,583	\$78,720	\$7,824	\$387,529
% Difference from Alt. A	0.0%	2.8%	2.8%	0.0%	0.0%	2.2%
Jobs	133	3,534	561	997	324	5,549
% Difference from Alt. A	0.0%	2.9%	2.9%	0.0%	0.0%	2.1%
Ad Valorem Taxes	N.A.	N.A.	\$23,715	\$9,271	N.A.	\$32,986

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
% Difference from Alt. A	N.A.	N.A.	2.8%	0.0%	N.A.	2.0%
Severance Taxes	N.A.	N.A.	\$21,429	\$6,941	N.A.	\$28,370
% Difference from Alt. A	N.A.	N.A.	2.8%	0.0%	N.A.	2.1%
FMR (Federal Share)	N.A.	N.A.	\$31,445	\$12,104	N.A.	\$43,549
% Difference from Alt. A	N.A.	N.A.	2.8%	0.0%	N.A.	2.0%
FMR (WY Share)	N.A.	N.A.	\$26,465	\$10,187	N.A.	\$36,652
% Difference from Alt. A	N.A.	N.A.	2.8%	0.0%	N.A.	2.0%

<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Initial values; these would increase each year from 2016 due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties

**Table N-20. Net Present Value (3% Discount Rate) by Program, 2016–2031, Alternative C (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$89,114	\$7,248,384	\$12,819,701	\$3,562,057	\$367,775	\$24,087,031
% Difference from Alt. A	0.0%	2.8%	2.8%	0.0%	0.0%	2.3%
Total Economic Output	\$163,791	\$8,988,281	\$15,359,591	\$5,648,698	\$453,010	\$30,613,372
% Difference from Alt. A	0.0%	2.8%	2.8%	0.0%	0.0%	2.2%
Total Labor Earnings	\$56,161	\$3,164,534	\$1,233,701	\$988,809	\$98,284	\$5,541,489
% Difference from Alt. A	0.0%	2.8%	2.8%	0.0%	0.0%	2.2%
Average Jobs Per Year	133	3,534	1,303	997	324	6,291
% Difference from Alt. A	0.0%	2.9%	2.8%	0.0%	0.0%	2.2%
Ad Valorem Taxes	N.A.	N.A.	\$655,566	\$116,457	N.A.	\$772,023
% Difference from Alt. A	N.A.	N.A.	2.8%	0.0%	N.A.	2.4%
Severance Taxes	N.A.	N.A.	\$592,379	\$87,183	N.A.	\$679,562

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
% Difference from Alt. A	N.A.	N.A.	2.8%	0.0%	N.A.	2.4%
FMR (Federal Share)	N.A.	N.A.	\$870,137	\$152,042	N.A.	\$1,022,179
% Difference from Alt. A	N.A.	N.A.	2.8%	0.0%	N.A.	2.4%
FMR (WY Share)	N.A.	N.A.	\$732,325	\$127,962	N.A.	\$860,287
% Difference from Alt. A	N.A.	N.A.	2.8%	0.0%	N.A.	2.4%

<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Incorporates annual increases in production due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties

**Table N-21. Net Present Value (7% Discount Rate) by Program, 2016–2031, Alternative C (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$67,019	\$5,451,189	\$8,980,103	\$2,678,866	\$276,587	\$17,453,764
% Difference from Alt. A	0.0%	2.8%	2.8%	0.0%	0.0%	2.3%
Total Economic Output	\$123,180	\$6,759,688	\$10,759,277	\$4,248,136	\$340,689	\$22,230,970
% Difference from Alt. A	0.0%	2.8%	2.8%	0.0%	0.0%	2.2%
Total Labor Earnings	\$42,236	\$2,379,906	\$864,199	\$743,639	\$73,915	\$4,103,895
% Difference from Alt. A	0.0%	2.8%	2.8%	0.0%	0.0%	2.2%
Average Jobs Per Year	133	3,534	1,303	997	324	6,291
% Difference from Alt. A	N.A.	2.9%	2.8%	0.0%	0.0%	2.2%
Ad Valorem Taxes	N.A.	N.A.	\$459,266	\$87,582	N.A.	\$546,848
% Difference from Alt. A	N.A.	N.A.	2.8%	0.0%	N.A.	2.3%
Severance Taxes	N.A.	N.A.	\$414,999	\$65,567	N.A.	\$480,566
% Difference from Alt. A	N.A.	N.A.	2.8%	0.0%	N.A.	2.4%
FMR (Federal Share)	N.A.	N.A.	\$609,524	\$114,344	N.A.	\$723,868

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
% Difference from Alt. A	N.A.	N.A.	2.8%	0.0%	N.A.	2.4%
FMR (WY Share)	N.A.	N.A.	\$512,988	\$96,234	N.A.	\$609,222
% Difference from Alt. A	N.A.	N.A.	2.8%	0.0%	N.A.	2.4%

<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Incorporates annual increases in production due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties

**Table N-22. Total Annual Impacts by Program, 2016, Alternative D (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$7,094	\$556,012	\$446,197	\$283,578	\$29,279	\$1,322,160
% Difference from Alt. A	0.0%	-0.9%	-1.0%	0.0%	0.0%	-0.7%
Total Economic Output	\$13,040	\$689,474	\$534,559	\$449,698	\$36,065	\$1,722,836
% Difference from Alt. A	0.0%	-0.9%	-1.0%	0.0%	0.0%	-0.7%
Total Labor Earnings	\$4,471	\$242,746	\$42,940	\$78,720	\$7,824	\$376,701
% Difference from Alt. A	0.0%	-0.9%	-1.0%	0.0%	0.0%	-0.7%
Jobs	133	3,404	540	997	324	5,398
% Difference from Alt. A	0.0%	-0.9%	-1.0%	0.0%	0.0%	-0.7%
Ad Valorem Taxes	N.A.	N.A.	\$22,841	\$9,271	N.A.	\$32,112
% Difference from Alt. A	N.A.	N.A.	-1.0%	0.0%	N.A.	-0.7%
Severance Taxes	N.A.	N.A.	\$20,639	\$6,941	N.A.	\$27,580
% Difference from Alt. A	N.A.	N.A.	-1.0%	0.0%	N.A.	-0.7%
FMR (Federal Share)	N.A.	N.A.	\$30,286	\$12,104	N.A.	\$42,390
% Difference from Alt. A	N.A.	N.A.	-1.0%	0.0%	N.A.	-0.7%
FMR (WY Share)	N.A.	N.A.	\$25,489	\$10,187	N.A.	\$35,676

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
% Difference from Alt. A	N.A.	N.A.	-1.0%	0.0%	N.A.	-0.7%

<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Initial values; these would increase each year from 2016 due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties

**Table N-23. Net Present Value (3% Discount Rate) by Program, 2016–2031, Alternative D (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$89,114	\$6,984,126	\$12,346,890	\$3,562,057	\$367,775	\$23,349,963
% Difference from Alt. A	0.0%	-0.9%	-1.0%	0.0%	N.A.	-0.8%
Total Economic Output	\$163,791	\$8,660,550	\$14,793,106	\$5,648,698	\$453,010	\$29,719,155
% Difference from Alt. A	0.0%	-0.9%	-1.0%	0.0%	N.A.	-0.8%
Total Labor Earnings	\$56,161	\$3,049,152	\$1,188,201	\$988,809	\$98,284	\$5,380,607
% Difference from Alt. A	0.0%	-0.9%	-1.0%	0.0%	N.A.	-0.7%
Average Jobs Per Year	133	3,405	1,255	997	324.0	6,114
% Difference from Alt. A	0.0%	-0.9%	-1.0%	0.0%	N.A.	-0.7%
Ad Valorem Taxes	N.A.	N.A.	\$631,390	\$116,457	N.A.	\$747,847
% Difference from Alt. A	N.A.	N.A.	-1.0%	0.0%	N.A.	-0.8%
Severance Taxes	N.A.	N.A.	\$570,533	\$87,183	N.A.	\$657,716
% Difference from Alt. A	N.A.	N.A.	-1.0%	0.0%	N.A.	-0.9%
FMR (Federal Share)	N.A.	N.A.	\$838,045	\$152,042	N.A.	\$990,087
% Difference from Alt. A	N.A.	N.A.	-1.0%	0.0%	N.A.	-0.8%
FMR (WY Share)	N.A.	N.A.	\$705,316	\$127,962	N.A.	\$833,278
% Difference from Alt. A	N.A.	N.A.	-1.0%	0.0%	N.A.	-0.8%

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
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<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Incorporates annual increases in production due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties

**Table N-24. Net Present Value (7% Discount Rate) by Program, 2016–2031, Alternative D (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$67,019	\$5,252,452	\$8,648,912	\$2,678,866	\$276,587	\$16,923,836
% Difference from Alt. A	0.0%	-0.9%	-1.0%	0.0%	N.A.	-0.8%
Total Economic Output	\$123,180	\$6,513,216	\$10,362,469	\$4,248,136	\$340,689	\$21,587,689
% Difference from Alt. A	0.0%	-0.9%	-1.0%	0.0%	N.A.	-0.7%
Total Labor Earnings	\$42,236	\$2,293,132	\$832,326	\$743,639	\$73,915	\$3,985,249
% Difference from Alt. A	0.0%	-0.9%	-1.0%	0.0%	N.A.	-0.7%
Average Jobs Per Year	133	3,405	1,255.0	997	324.0	6,114
% Difference from Alt. A	0.0%	-0.9%	-1.0%	0.0%	N.A.	-0.7%
Ad Valorem Taxes	N.A.	N.A.	\$442,329	\$87,582	N.A.	\$529,911
% Difference from Alt. A	N.A.	N.A.	-1.0%	0.0%	N.A.	-0.8%
Severance Taxes	N.A.	N.A.	\$399,695	\$65,567	N.A.	\$465,262
% Difference from Alt. A	N.A.	N.A.	-1.0%	0.0%	N.A.	-0.8%
FMR (Federal Share)	N.A.	N.A.	\$587,045	\$114,344	N.A.	\$701,389
% Difference from Alt. A	N.A.	N.A.	-1.0%	0.0%	N.A.	-0.8%
FMR (WY Share)	N.A.	N.A.	\$494,069	\$96,234	N.A.	\$590,303
% Difference from Alt. A	N.A.	N.A.	-1.0%	0.0%	N.A.	-0.8%

	<b>Livestock Grazing (Billed Use)<sup>1</sup></b>	<b>Oil and Gas Well Development<sup>1</sup></b>	<b>Oil and Gas Production<sup>2</sup></b>	<b>Coal and Soda Ash Production<sup>1,3</sup></b>	<b>Recreation (High Visitation)<sup>1</sup></b>	<b>Total BLM-Supported</b>
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<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Incorporates annual increases in production due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties



## **N.5 ACRONYMS LIST**

AFE	Authorization for Expenditures
AUM	Animal Unit Month
BBL	Barrel
BEA	Bureau of Economic Analysis
BLM	Bureau Land Management
BLS	Bureau of Labor Statistics
CBNG	Coalbed Natural Gas
ERS	Economic Research Service
EIA	U.S. Energy Information Administration
EIS	Environmental Impact Statement
FAQ	Frequently Asked Questions
FY	Fiscal year
IMPLAN	IMPact analysis for PLANning
KSLA	Known Sodium Leasing Area
MCF	Million Cubic Feet
NVUM	USFS National Visitor Use Monitoring
OHV	Off-highway vehicle
OMB	Office of Management and Budget
ONRR	Department of the Interior Office of Natural Resources Revenue
RFD	Reasonable Foreseeable Development
RMIS	Recreation Management Information System
RMP	Resource Management Plan
RSFO	Rock Springs Field Office
USDA	United States Department of Agriculture
USFS	United States Forest Service

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# N.7 ATTACHMENT 1. CALCULATION OF DIRECT ECONOMIC CONTRIBUTION AND DIRECT ECONOMIC IMPACT (EXAMPLE)

Rock Springs Field Office Recreation Spending (High Visitation Estimate)																					
Alternative A																					
All dollar values are in 2014 dollars. Highlighting indicates NVUM data. All other data are for the RSFO, directly or by calculation.																					
	Wildlife			Other			Total			Average			Wildlife			Other			Total		
	Related	Related	Related	Individual	Individual	Individual	Party	Party	Party	Party	Party	Party	Party	Party	Party	Party	Party	Party	Party		
Trip Type	Related	Visits	Visits	Visits	Visits	Visits	Size	Visits	Visits	Visits	Visits	Spending	Spending	Spending	Spending	Spending	Spending	Spending	Spending		
Non-local Day Trips	39.7%	39.7%	39.7%	133,356	203,029	336,385	2.59	51,489	78,390	129,878	\$76.73	\$58.61	\$3,950,590	\$4,594,796	\$8,545,386	100.00%	\$8,545,386				
Non-local Overnight on BLM	18.3%	18.3%	18.3%	61,472	93,588	155,059	3.00	20,491	31,196	51,686	\$300.93	\$179.24	\$6,166,264	\$5,591,588	\$11,757,851	100.00%	\$11,757,851				
Non-local Overnight off BLM	4.6%	4.6%	4.6%	15,452	23,525	38,977	2.77	5,578	8,493	14,071	\$566.17	\$338.18	\$3,158,234	\$2,872,020	\$6,030,253	100.00%	\$6,030,253				
Local Day Trips	22.9%	22.9%	22.9%	76,923	117,112	194,036	2.90	26,525	40,384	66,909	\$45.34	\$36.59	\$1,202,528	\$1,477,712	\$2,680,240	17.00%	\$455,641				
Local Overnight on BLM	8.8%	8.8%	8.8%	29,560	45,004	74,564	3.21	9,209	14,020	23,229	\$220.28	\$162.73	\$2,028,526	\$2,281,455	\$4,309,981	36.00%	\$1,551,593				
Local Overnight off BLM	1.2%	1.2%	1.2%	4,031	6,137	10,168	2.32	1,737	2,645	4,383	\$208.70	\$205.53	\$362,612	\$543,670	\$906,282	46.00%	\$416,890				
Non Primary Visits	4.5%	4.5%	4.5%	15,116	23,013	38,129	2.93	5,159	7,854	13,013	\$45.34	\$36.59	\$233,885	\$287,407	\$521,292	100.00%	\$521,292				
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>335,910</b>	<b>511,408</b>	<b>847,318</b>	<b>2.79</b>	<b>120,188</b>	<b>182,981</b>	<b>303,170</b>	<b>\$142.30</b>	<b>\$96.45</b>	<b>\$17,102,638</b>	<b>\$17,648,648</b>	<b>\$34,751,286</b>						
				335,910	511,408	847,318										Per Party	\$114.63				
				39.6%	60.4%	100.0%										Per Person	\$41.01				
<b>Low Spending Profile</b>	<b>Wildlife</b>	<b>Wildlife</b>	<b>Wildlife</b>	<b>Wildlife</b>	<b>Wildlife</b>	<b>Wildlife</b>	<b>Wildlife</b>	<b>Other</b>	<b>Other</b>	<b>Other</b>	<b>Other</b>	<b>Other</b>	<b>Other</b>	<b>Other</b>	<b>Other</b>						
	NL Day	NL OVN-NF	NL-OVN	Local Day	Local OVN-NF	Local OVN	Not Primary	NL Day	NL OVN-NF	NL-OVN	Local Day	Local OVN-NF	Local OVN	Not Primary							
MOTEL	\$0.00	\$48.45	\$197.92	\$0.00	\$4.85	\$24.27	\$0.00	\$0.00	\$20.00	\$110.55	\$0.00	\$4.53	\$35.53	\$0.00							
CAMPGROUND	\$0.00	\$29.86	\$13.48	\$0.00	\$29.24	\$13.87	\$0.00	\$0.00	\$20.75	\$16.13	\$0.00	\$24.63	\$17.95	\$0.00							
RESTURANT & BAR	\$9.49	\$25.73	\$95.62	\$3.08	\$8.16	\$13.86	\$3.08	\$11.63	\$18.98	\$70.20	\$5.70	\$7.17	\$26.40	\$5.70							
GROCERY	\$11.80	\$66.81	\$84.40	\$6.76	\$76.43	\$58.82	\$6.76	\$9.38	\$45.20	\$44.39	\$6.98	\$64.93	\$52.49	\$6.98							
GASOLINE	\$40.84	\$84.83	\$88.90	\$22.28	\$69.09	\$63.24	\$22.28	\$27.52	\$49.10	\$60.94	\$15.87	\$41.57	\$47.32	\$15.87							
LOCAL TRANSPORTATION	\$0.13	\$0.70	\$1.53	\$0.03	\$0.02	\$1.17	\$0.03	\$0.10	\$0.75	\$1.63	\$0.06	\$0.06	\$1.05	\$0.06							
ENTRY FEES	\$2.17	\$10.20	\$10.01	\$1.89	\$3.12	\$1.86	\$1.89	\$3.72	\$8.09	\$5.60	\$3.11	\$5.79	\$3.42	\$3.11							
RECREATION & ENTERTAINMENT	\$1.21	\$5.98	\$30.56	\$0.87	\$1.36	\$0.49	\$0.87	\$2.80	\$4.50	\$9.93	\$0.73	\$2.17	\$0.45	\$0.73							
SPORTING GOODS	\$9.06	\$20.84	\$23.61	\$9.89	\$25.14	\$23.28	\$9.89	\$2.54	\$7.82	\$9.02	\$3.75	\$10.98	\$10.23	\$3.75							
SOUVENIRS	\$2.02	\$7.53	\$20.15	\$0.54	\$2.87	\$7.83	\$0.54	\$0.91	\$4.04	\$9.77	\$0.39	\$0.90	\$10.69	\$0.39							
<b>TOTAL</b>	<b>\$76.73</b>	<b>\$300.93</b>	<b>\$566.17</b>	<b>\$45.34</b>	<b>\$220.28</b>	<b>\$208.70</b>	<b>\$45.34</b>	<b>\$58.61</b>	<b>\$179.24</b>	<b>\$338.18</b>	<b>\$36.59</b>	<b>\$162.73</b>	<b>\$205.53</b>	<b>\$36.59</b>							
	Wildlife	Wildlife	Wildlife	Wildlife	Wildlife	Wildlife	Wildlife	Other	Other	Other	Other	Other	Other	Other	Other	Direct	Direct				
	NL Day	NL OVN-NF	NL-OVN	Local Day	Local OVN-NF	Local OVN	Not Primary	NL Day	NL OVN-NF	NL-OVN	Local Day	Local OVN-NF	Local OVN	Not Primary	Economic	Economic					
MOTEL	\$0	\$992,845	\$1,104,032	\$0	\$44,700	\$42,176	\$0	\$0	\$624,018	\$938,901	\$0	\$63,531	\$93,996	\$0	\$3,904,199	\$3,761,398.59					
CAMPGROUND	\$0	\$611,869	\$75,212	\$0	\$269,296	\$24,094	\$0	\$0	\$647,193	\$136,991	\$0	\$345,258	\$47,483	\$0	\$2,157,396	\$1,725,429.95					
RESTURANT & BAR	\$488,872	\$527,211	\$533,380	\$81,679	\$75,114	\$24,082	\$15,886	\$911,827	\$592,173	\$596,208	\$230,207	\$100,537	\$69,834	\$44,774	\$4,291,783	\$3,869,786.62					
GROCERY	\$607,729	\$1,368,910	\$470,791	\$179,319	\$703,804	\$102,204	\$34,877	\$735,255	\$1,410,169	\$376,983	\$281,922	\$910,283	\$138,837	\$54,832	\$7,375,915	\$5,829,907.16					
GASOLINE	\$2,102,684	\$1,738,163	\$495,886	\$591,111	\$636,237	\$109,875	\$114,968	\$2,157,022	\$1,531,646	\$517,562	\$640,980	\$582,823	\$125,175	\$124,667	\$11,468,799	\$9,539,038.04					
LOCAL TRANSPORTATION	\$6,807	\$14,315	\$8,529	\$902	\$157	\$2,035	\$175	\$8,184	\$23,322	\$13,882	\$2,463	\$857	\$2,774	\$479	\$84,880	\$78,841.70					
ENTRY FEES	\$111,746	\$209,044	\$55,838	\$50,149	\$28,740	\$3,236	\$9,754	\$291,962	\$252,509	\$47,601	\$125,730	\$81,189	\$9,043	\$24,454	\$1,300,994	\$1,078,029.81					
RECREATION & ENTERTAINMENT	\$62,528	\$122,623	\$170,475	\$22,963	\$12,535	\$848	\$4,466	\$219,616	\$140,341	\$84,321	\$29,423	\$30,364	\$1,180	\$5,723	\$907,407	\$835,375.56					
SPORTING GOODS	\$466,278	\$427,067	\$131,706	\$262,211	\$231,478	\$40,450	\$50,999	\$199,337	\$244,064	\$76,574	\$151,305	\$153,934	\$27,061	\$29,428	\$2,491,893	\$1,865,554.56					
SOUVENIRS	\$103,941	\$154,216	\$112,385	\$14,196	\$26,464	\$13,613	\$2,761	\$71,593	\$126,150	\$82,997	\$15,677	\$12,677	\$28,288	\$3,049	\$768,007	\$695,535.39					
<b>TOTAL</b>	<b>\$3,950,585</b>	<b>\$6,166,264</b>	<b>\$3,158,234</b>	<b>\$1,202,530</b>	<b>\$2,028,525</b>	<b>\$362,611</b>	<b>\$233,886</b>	<b>\$4,594,796</b>	<b>\$5,591,585</b>	<b>\$2,872,020</b>	<b>\$1,477,708</b>	<b>\$2,281,454</b>	<b>\$543,670</b>	<b>\$287,406</b>	<b>\$34,751,274</b>	<b>\$29,278,897</b>					

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# APPENDIX O—REMI MODEL APPLICATION AND DISCUSSION

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## O.1 SUMMARY

The State of Wyoming Economic Analysis Division prepared a Regional Economic Models, Inc. (REMI) model analysis in collaboration with the Bureau of Land Management (BLM), the Cooperating Agencies, and a BLM contractor team (Booz Allen Hamilton and the University of Wyoming). The REMI analysis addressed the same resource uses as the Impact Analysis for Planning (IMPLAN) model analysis. The REMI model analysis was only conducted for Alternatives A and B for oil and gas development, oil and gas production, and recreation, and for Alternative A for livestock grazing, coal production, and trona (soda ash) production. This was because the levels of all resource use activities are expected to differ only marginally (a few percent or less) between Alternatives A, C, and D, and Alternative B substantially differs from Alternative A only for oil and gas development, oil and gas production, and recreation.<sup>1</sup>

The direct impact inputs for each model were the same. However, the methodologies for inputting those values to each model differed to varying degrees for each resource use, in large part due to differences in the industrial sectors available in REMI compared to IMPLAN, and to the need to disaggregate the inputs used for the five-county IMPLAN model to each of the five county-specific REMI models owned by the state. The process for disaggregating inputs included consultation with BLM Rock Springs Field Office (RSFO) resource specialists and review of relevant tabular and spatial data. For each resource use, the majority of the input amounts were allocated to Sweetwater County. The results from the REMI model for each of the five counties were reaggregated to socioeconomic study area totals for comparison with the IMPLAN model results.

Table O.1-1 summarizes the REMI model results and compares the results to the IMPLAN model results on a percentage difference basis. This table only addresses annual impacts for 2016; however, the comparisons based on net present value are not dramatically different. In most cases, the table shows that the results of the two models are within 20%, which is very reasonable given the many considerations involved in economic impact modeling. The differences for grazing and oil and gas production are larger. However, those differences may be explained by methodological factors described below rather than any inherent “error” in either model. Readers interested in the differences between the two models and their results should carefully review the detailed tables and discussions below, particularly regarding reasons for the differences between the two models’ results for grazing and oil and gas production.

Based on the reasonable effort made toward an apples-to-apples comparison between the models, the differences in results between the IMPLAN and REMI models are not so great that they would lead to different management decisions (selection of a different preferred alternative) if REMI were used for the quantitative economic analysis instead of IMPLAN. They do not tell decisively different economic stories about the nature of the local economy or the alternatives.

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<sup>1</sup> *The analysis in this appendix was conducted in 2016 – 2017. At that time, the analysis team understood the management decisions for recreation under Alternative B to mean that the Killpecker Sand Dunes area would be closed. It was assumed that effectively, all recreation visits to that site as indicated by available RMIS data would no longer occur. This is not the case. Under Alternative B, the Killpecker Sand Dunes Special Recreation Management Area would not be retained, but recreation could and would continue at that site. The numbers and discussion for Alternative B throughout this appendix are based on the 2016 – 2017 assumption of closure of the Killpecker Sand Dunes. It was not feasible to update the REMI analysis or the IMPLAN-REMI comparisons. This does not affect the conclusions drawn in this appendix, because the differences in the results for recreation under Alternative B would be marginal (a few percentage points).*

**Table O.1-1. REMI Results: Total Economic Impacts by Program by Alternative**

	Alt. A REMI Result	Alt. B REMI Result	Alt. A Difference from IMPLAN Result	Alt. B Difference from IMPLAN Result
<b>Total Economic Output, Annual Impact, 2016 (1,000s of 2014\$)</b>				
Livestock Grazing (Billed Use) <sup>1</sup>	\$8,843	\$8,843	-32%	-32%
Oil and Gas Development <sup>1</sup>	\$668,110	\$177,988	-4%	-4%
Oil and Gas Production <sup>2</sup>	\$899,852	\$238,583	67%	67%
Coal and Soda Ash Production <sup>1,3</sup>	\$380,065	\$380,065	-15%	-15%
Recreation (High Visitation) <sup>1</sup>	\$32,733	\$28,342	-9%	-9%
<b>Total BLM-Supported</b>	<b>\$1,989,603</b>	<b>\$833,821</b>	<b>15%</b>	<b>1%</b>
<b>Total Labor Earnings, Annual Impact, 2016 (1,000s of 2014\$)</b>				
Livestock Grazing (Billed Use) <sup>1</sup>	\$1,870	\$1,870	-58%	-58%
Oil and Gas Development <sup>1</sup>	\$277,766	\$73,752	13%	13%
Oil and Gas Production <sup>2</sup>	\$79,990	\$21,205	84%	85%
Coal and Soda Ash Production <sup>1,3</sup>	\$77,420	\$77,420	-2%	-2%
Recreation (High Visitation) <sup>1</sup>	\$9,106	\$7,884	16%	16%
<b>Total BLM-Supported</b>	<b>\$446,152</b>	<b>\$182,131</b>	<b>18%</b>	<b>9%</b>
<b>Total Employment, Annual Impact, 2016 (number of jobs)</b>				
Livestock Grazing (Billed Use) <sup>1</sup>	115	115	-13%	-13%
Oil and Gas Development <sup>1</sup>	3,106	829	-10%	-10%
Oil and Gas Production <sup>2</sup>	953	253	75%	75%
Coal and Soda Ash Production <sup>1,3</sup>	809	809	-19%	-19%
Recreation (High Visitation) <sup>1</sup>	274	237	-16%	-16%
<b>Total BLM-Supported</b>	<b>5,256</b>	<b>2,244</b>	<b>-3%</b>	<b>-9%</b>

<sup>1</sup> Assumes constant annual activity level (based on available data).

<sup>2</sup> Would rise each year from 2016 due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

## O.2 INTRODUCTION

This Appendix describes the overall intent, methods, and results for the REMI Pilot Project conducted for the Rock Springs Resource Management Plan (RMP). This effort originated in 2012 in response to Cooperating Agency counties advocating for the use of the economic and demographic modeling software, REMI, for quantifying economic and demographic impacts associated with the RMP alternatives. The BLM, the State of Wyoming (hereafter, the State), and the Wyoming County Commissioners Association

agreed to a joint effort to conduct a comparative analysis using REMI. The agreement is documented in an Amendment to the Memorandum of Understanding (MOU) between the BLM, the State, and the Agencies Cooperating in the revision of the Rock Springs RMP. The framework the parties agreed upon contained the following understanding and commitments:

- The quantitative economic impact analysis would proceed as originally planned for by the BLM for the RMP/Environment Impact Statement (EIS) and would be conducted by the Booz Allen Hamilton/University of Wyoming team using the IMPLAN model. The results of the IMPLAN - based analysis are summarized in Chapter 4 and the technical approach is described in Appendix N, Technical Report: Social and Economic Impact Analysis Methodology.
- The Wyoming Economic Analysis Division (WYEAD) would lead the REMI analysis using the county-level REMI model owned by the State.
- There would be close coordination between the two efforts involving economists and social scientists representing the BLM, the State, and the Cooperating Agencies.
- The comparative REMI analysis would be briefly summarized in Chapter 4 and described in greater detail in a standalone appendix.

Since 2012, a significant amount of coordination has taken place to implement this comparative analysis. This coordination included a 2012 presentation to the Cooperating Agencies on the effort, which included an overview of input-output modelling, background information on both IMPLAN and REMI, details on parameters and inputs required for the analysis, and outputs of the models. The BLM and the WYEAD convened for several workshops and multiple conference calls to coordinate the technical details of the analysis and review and discuss results.

Subsequent sections of this Appendix include a description of the REMI model, an overview of the methodology used for analyzing RMP alternatives in REMI, detailed results, and a discussion comparing the REMI and IMPLAN results.

## **O.3 WHAT IS THE REMI MODEL?**

The REMI model, developed by Regional Economic Models, Inc., is a structural and dynamic economic and demographic forecasting and policy analysis and simulation tool. The tool was developed starting in 1980 to assist decision-makers in testing the economic effects of their policies before implementation. REMI's goal is to develop and support the use of economic models that inform government and corporate decisions.

The Wyoming Department of Administration and Information, Economic Analysis Division (EAD) currently uses two 70-sector version 2.1 REMI PI+ models containing baseline data through 2015: (1) a single-region model covering the entire state of Wyoming, and (2) a 23-region model of for each of the Wyoming counties. The 70 REMI sectors generally cross-walk into the North American Industry Classification System (NAICS) 3-digit industrial codes.

### **O.3.1 Characteristics of the REMI Model**

The REMI model incorporates aspects of four major modeling approaches: Input-Output, General Equilibrium, Econometric, and Economic Geography. Each of these methodologies has distinct advantages as well as limitations when used alone. The REMI integrated modeling approach builds on the strengths of each of these approaches. A basic overview of each modeling approaches is provided below. More detailed information is available on REMI's website at <http://www.remi.com/>. By comparison, the IMPLAN model is based on Input-Output modeling but does not include the other three modeling approaches used in REMI.



## Input-Output

The REMI model at its core has the inter-industry relationships found in input-output models such as IMPLAN. As a result, the industry structure of a particular region is captured within the model, as well as transactions between industries. Changes that affect industry sectors that are highly interconnected to the rest of the economy will often have a greater economic impact than those for industries that are not closely linked to the regional economy. The input-output components of REMI and IMPLAN differ in some respects (e.g., industry sector breakdown, inter-industry coefficients based on different data or parameterization of data), but they follow the same fundamental input-output modeling principles.

## General Equilibrium

General equilibrium is reached when supply and demand are balanced. This tends to occur in the long run, as prices, production, consumption, imports, exports, and other changes occur to stabilize the economic system. For example, if real wages in a region rise relative to the U.S., this will tend to attract economic migrants to the region until relative real wage rates equalize. The general equilibrium properties are necessary to evaluate changes such as tax policies that may have an effect on regional prices and competitiveness.

## Econometric

REMI is sometimes called an “econometric model,” as the underlying equations and responses are estimated using advanced statistical techniques. The estimates are used to quantify the structural relationships in the model. The speed of economic responses is also estimated, since different adjustment periods will result in different policy recommendations and even different economic outcomes.

## Economic Geography

The economic geography features represent the spatial dimension of the economy. Transportation costs and accessibility are important economic determinants of interregional trade and the productivity benefits that occur due to industry clustering and labor market access. Firms benefit having access to a large, specialized labor pool and from having access to specialized intermediate inputs from supplying firms. The productivity and competitiveness benefits of labor and industry concentrations are called agglomeration economies and are modeled in the economic geography equations.

## PI+

PI+, the next generation of REMI Inc.’s Policy Insight product, is the core product of REMI. It incorporates the modeling approaches noted above and generates year-by-year estimates of the total regional effects of any specific policy initiative or set of economic inputs. A wide range of policy variables allows the user to represent the policy or change to be evaluated, while the explicit structure in the model helps the user to interpret the predicted economic and demographic effects. The model is calibrated to many sub-national areas such as an individual county for policy analysis and forecasting, and is available in single- and multi-area configurations. Each calibrated area (or region) has economic and demographic variables, as well as policy variables so that any policy or change that affects a local economy can be tested.

Regional policy analysis models can play an important role in evaluating the economic effects of alternative courses of action. Users can answer “what if” questions about the economic effects of policies in areas such as economic development, energy, transportation, the environment, and resource use. Thus, simulation models for state and local economies can help guide decision makers in formulating strategies for these geographical areas.

The model is dynamic, with forecasts and simulations generated on an annual basis based on behavioral responses to compensation, price, and other economic factors. The model consists of thousands of simultaneous equations with a structure that is relatively straightforward. The exact number of equations used varies depending on the extent of industry, demographic, demand, and other detail in the specific model being used. The overall structure of the model can be summarized in five major blocks: (1) Output and Demand, (2) Labor and Capital Demand, (3) Population and Labor Supply, (4) Compensation, Prices, and Costs, and (5) Market Shares.

Different from a snapshot for static analysis (a specific effect in a given moment of time), a dynamic analysis looks at direct, indirect, and induced effects of a policy or scenario across time. Dynamic economic modeling is able to capture 1) the robust potential of the economy, and able to estimate future gains from innovation and increased productivity (labor or capital) through proliferation of technology in different industries throughout a forecasting period, and 2) capture interactions occurring throughout the economy between both market factors and demographic factors; e.g., interrelationship among different aspects of the economy such as labor markets, migration, market share, compensation, prices, and costs.

## **O.4 METHODOLOGY**

### **O.4.1 Overview**

Consistent with the IMPLAN-based analysis conducted for the Rock Springs RMP/EIS, the REMI analysis was conducted for the following activities/resource uses:

- Oil and natural gas development
- Oil and natural gas production
- Coal production
- Trona (soda ash) production
- Livestock grazing
- Recreation.

For readers' reference, the concept of direct, indirect, and induced impacts in the REMI model is basically not different from any other economic impact modeling tool such as IMPLAN. Once a direct impact of an economic activity is identified and inputted into REMI, the model is able to estimate indirect and induced impacts generated in the local economy as the direct impact ripples through the economy. The indirect impact is through intermediate demand or supply chain effects because of goods and services purchases generated from the direct impact, while the induced impact refers to local consumption demand effects as a result of increased spending of employees and households generated from the direct impact and indirect impact industries.

Output results from the REMI model (definitions are generally consistent with IMPLAN) include:

- Employment – Because the primary data source for REMI PI+ is the U.S. Bureau of Economic Analysis (BEA), the definition of employment is consistent with BEA's definition. Employment comprises estimates of the number of jobs, full-time plus part-time, mostly by place of work. Full-time and part-time jobs are counted at equal weight, with both on an annual basis (seasonal jobs are adjusted to annual equivalents). Wage and salary employees, sole proprietors, and active partners are included, but unpaid family workers and volunteers are not included.
- Labor Earnings – The sum of earnings by place of work for private industries, state and local government, federal civilian, federal military, and farm sectors, including wages and salaries, benefits, and proprietors' income.

- Output – The amount of production, including all intermediate goods purchased as well as value added (compensation and profit). In most cases, output represents sales or supply. The components of Output are Self Supply or Use, and Exports (Multi-regions, Rest of Nation, and Rest of World).
- Average Earnings Per Job (AEPJ) – Labor Earnings divided by Employment.
- Labor Productivity – Output divided by Employment.

All of the resource uses considered in this analysis are already established on BLM-managed lands within the RSFO. With the exception of oil and gas production, Alternative A (No Action) assumes the level of activity associated with each resource use will remain constant and equal to current levels. As noted in Appendix N, Technical Report: Social and Economic Impact Analysis Methodology, oil and gas production and development reflects only new wells. However, oil and gas production and development are present, and industries associated with this activity are well established in the region. New wells in Alternative A essentially represent continuation of recent levels of development activity. While these wells will increase production to some degree in the RSFO, they will also replace production as existing wells in the RSFO decline in productivity over time. Therefore, across all resource uses, the analysis generally tracks the economic activity supported by current levels of resource uses – commonly referred to as an economic contribution analysis. This differs from an economic impact analysis that estimates the effect of new economic activity or a “shock” impact. Consequently, the State utilized specifications for the REMI model that would better model economic contributions, versus modeling an economic shock. These specifications and additional calibrations are discussed below.

With respect to the various management alternatives, the levels of oil and gas activity under Alternatives C and D only differ marginally (a few percent) from Alternative A. The levels of activity for all other resource uses are expected to be essentially identical (any differences cannot be confidently quantified) between Alternatives A, C, and D. Alternative B has substantial differences from Alternative A in economic activity for oil and gas development, oil and gas production, and recreation. Therefore, the REMI model analysis, and comparisons of its results to the IMPLAN model results, were only conducted for Alternatives A and B for those three resource uses, and for Alternative A for livestock grazing, coal production, and trona (soda ash) production.

## **O.4.2 REMI Model Calibration**

Both the REMI and IMPLAN models require various calibrations prior to impact analysis. Calibration is manual adjustment of economic parameters in order to better match a model to the local economy compared to the unadjusted, “out of the box” parameters in a model’s data and specifications of economic relationships.

The State selected a model specification for REMI where “Investment Response to Capital Stock” was turned off, versus the REMI standard model specification with that response turned on. This component of REMI estimates the economic activity associated with the investment that occurs through the capital stock adjustment process. Specifically, the investment in new housing, commercial and industrial buildings, and equipment corresponds to an economic impact or shock. However, in the economic contribution framework, the level of investment is significantly lower than in an economic impact or shock framework.

In addition, because regional economic models typically include assumptions and estimation based on regional or national data that may not align well with local conditions, the State reviewed various parameters for accuracy. Upon review, some of the county-level baseline data used in the REMI model were inconsistent with other data sources and seemed either too high or too low. Therefore, the State used data from the U.S. Census Bureau’s Economic Census and U.S. Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages to implement the following calibrations to REMI’s New Regional Control (the new baseline model in REMI):

- Increased labor productivity in Oil and Gas Extraction (NAICS sector 211) for both Sweetwater and Sublette counties.
- Redistributed employment between Oil and Gas Extraction (211) and Support Activities for Mining (213) for Sublette.
- Reduced labor productivity in Support Activities for Mining (213) for Sweetwater and Sublette counties.
- Reduced compensation rate in Support Activities for Mining (213) for Sublette County.
- Reduced labor productivity and compensation rate in Chemical Manufacturing (325) for Sweetwater County.

In addition, since REMI does not automatically apply margining for wholesale trade and retail trade industries, we assumed the margin value to be 34.6% for food stores and other retail trade, and 17.3% for wholesale trade when related expenditures were inserted into the model, based on data in IMPLAN. See Appendix N for a discussion of margining.

### **O.4.3 REMI Inputs by Resource Use**

The State participated in multiple discussions with the BLM and representatives of local governments and other Cooperating Agencies regarding input data processing and development. Participants in those discussions mutually agreed that the direct impact input data from the BLM used in the IMPLAN analysis should be used for the REMI analysis. Therefore, the total amounts of direct economic impacts that were used as inputs to the REMI model for each resource use were identical to those for IMPLAN model. Appendix N describes the procedures and data used to derive the direct impacts used for the IMPLAN model. All expenditures from 2016 to 2031 are in 2014 constant dollars, which is consistent with the IMPLAN analysis.

While the direct impacts for each model were the same, the methodologies for inputting those values to each model differed to varying degrees for each resource use, in large part due to differences in the industrial sectors available in REMI compared to IMPLAN and to the need to disaggregate the inputs used for the five-county IMPLAN model to each of the five county-specific REMI models owned by the State. The process for determining the REMI-specific inputs was highly collaborative.

The REMI sector scheme (70 sectors) differs from the IMPLAN sector scheme that consists of 536 sectors. The State reviewed the assumed distribution of inputs to IMPLAN sectors for each resource use (see Appendix N) and identified that REMI sector that most closely matches. The BLM and its RMP/EIS contractors reviewed this crosswalk exercise. In addition, because the State's 23-region REMI model for counties treats each county as an individual region, the inputs needed to be disaggregated across the five counties in the study area. The process for disaggregating inputs included consultation with BLM resource specialists and review of relevant tabular and spatial data. For each resource use, the majority of the input amounts were allocated to Sweetwater County; the specific allocations are noted below.

### **Oil and Gas Development (Drilling and Completion)**

Based on the reasonable foreseeable development (RFD) projections of where the most oil and gas development will occur during the planning period (the extreme northwest and southeast corners of the RSFO), the study team estimated that most of the economic activity due to that development will occur in Sweetwater and Sublette counties. It is likely that some oil and gas development goods and services are supplied from businesses located in Fremont, Lincoln, and Uinta counties, but the amount is likely to be minimal compared to Sweetwater and Sublette counties. Therefore, 60% of the expenditures were allocated

to Sweetwater County and 40% were allocated to Sublette County based on industry employment data from the BLS.

For the calibration, labor productivity for Support Activities for Mining (NAICS code 213) in both Sweetwater and Sublette counties was decreased to be roughly consistent with REMI's historical trend and U.S. Census Bureau's Economic Census results. The compensation rate in Support Activities for Mining for Sublette was also reduced, and the employment figures for Oil and Gas Extraction (NAICS code 211) and Support Activities for Mining (NAICS code 213) for Sublette were redistributed based on BLS data. In addition, a margin value of 17.3% was assumed for wholesale trade when related expenditures were inserted into the model, based on data in IMPLAN.

Table O.4-1 and Table O.4-2 show the direct impact inputs to the REMI model by sector<sup>2</sup> and county for Alternative A and Alternative B. The input amounts were the same for each year from 2016 to 2031.

**Table O.4-1. Inputs for Oil and Gas Development – Alternative A (millions of 2014\$)**

Sector – NAICS Code	Sublette	Sweetwater
Drilling Oil and Gas Wells - 2131111	\$67.40	\$101.10
Other Support Activities for Mining - 21311A (REMI sector combining 4 NAICS codes)	\$91.53	\$137.26
Labor Income (Contract Labor) - 213	\$9.25	\$13.88
Power and Communication Structures - 233240	\$6.13	\$9.19
Highways and Streets - 233293	\$2.71	\$4.06
Wholesale Trade - 420000	\$17.38	\$26.07
Truck Transportation - 484000	\$11.97	\$17.95
Wired Telecommunications Carriers - 517110	\$0.02	\$0.03
Insurance Agencies, Brokerages, and Related Activities - 524200	\$0.17	\$0.26
Commercial and Industrial Machinery and Equipment Rental and Leasing - 532400	\$12.06	\$18.09
Legal Services - 541100	\$1.25	\$1.88
Accounting, Tax Preparation, Bookkeeping, and Payroll Services - 541200	\$0.48	\$0.72
Architectural, Engineering, and Related Services - 541300	\$3.96	\$5.93
Waste Management and Remediation Services - 562000	\$0.12	\$0.18
<b>Total Input</b>	<b>\$224.43</b>	<b>\$336.64</b>

**Table O.4-2. Inputs for Oil and Gas Development – Alternative B (millions of 2014\$)**

Sector – NAICS Code	Sublette	Sweetwater
Drilling Oil and Gas Wells - 2131111	\$17.99	\$26.98
Other Support Activities for Mining - 21311A (multiple NAICS codes)	\$24.31	\$36.46
Labor Income (Contract Labor) - 213	\$2.45	\$3.68
Power and Communication Structures - 233240	\$1.62	\$2.44
Highways and Streets - 233293	\$0.75	\$1.12

<sup>2</sup> Including the NAICS (North American Industry Classification System) code for each sector.

Wholesale Trade - 420000	\$4.63	\$6.94
Truck Transportation - 484000	\$3.18	\$4.78
Wired Telecommunications Carriers - 517110	\$0.01	\$0.01
Insurance Agencies, Brokerages, and Related Activities - 524200	\$0.05	\$0.07
Commercial and Industrial Machinery and Equipment Rental and Leasing - 532400	\$3.24	\$4.86
Legal Services - 541100	\$0.34	\$0.50
Accounting, Tax Preparation, Bookkeeping, and Payroll Services - 541200	\$0.16	\$0.25
Architectural, Engineering, and Related Services - 541300	\$1.07	\$1.61
Waste Management and Remediation Services - 562000	\$0.03	\$0.05
<b>Total Input</b>	<b>\$59.83</b>	<b>\$89.75</b>

### Oil and Gas Production (Extraction)

Due to the same reason as described above for oil and gas development, oil and gas production input data were allocated to only Sweetwater and Sublette counties, but the proportion of production value was 78% for Sweetwater County and 22% for Sublette County based on industry employment data from the BLS.

For the calibration, labor productivity for Oil and Gas Extraction (NAICS code 211) in both Sweetwater and Sublette counties was increased to be roughly consistent with REMI's historical trend and the U.S. Census Bureau's Economic Census results. In addition, the proportion of employment between Oil and Gas Extraction (NAICS code 211) and Support Activities for Mining (NAICS code 213) for Sublette County was assumed to be 50% each, based on BLS data. The original REMI baseline forecast assumed this distribution to be 91% in oil and gas extraction and less than 9% in support activities in mining.

Table O.4-3 and Table O.4-4 show the direct impact inputs to the REMI model by sector and county for Alternative A and Alternative B. The input amounts increased in each year from 2016 to 2031 due to additional wells coming into production each year. All direct impact inputs were allocated to the Oil and Gas Extraction (NAICS code 211) sector.

**Table O.4-3. Inputs for Oil and Gas Production – Alternative A (millions of 2014\$)**

County	2016	2017	2018	2019	2020	2021	2022	2023
Sweetwater	\$351.5	\$382.9	\$445.7	\$504.3	\$545.4	\$635.9	\$675.5	\$791.1
Sublette	\$99.1	\$108.0	\$125.7	\$142.2	\$153.8	\$179.4	\$190.5	\$223.1
County	2024	2025	2026	2027	2028	2029	2030	2031
Sweetwater	\$819.0	\$918.1	\$979.6	\$1,059.2	\$1,177.3	\$1,221.6	\$1,249.4	\$1,314.0
Sublette	\$231.0	\$259.0	\$276.3	\$298.7	\$332.1	\$344.6	\$352.4	\$370.6

**Table O.4-4. Inputs for Oil and Gas Production – Alternative B (millions of 2014\$)**

County	2016	2017	2018	2019	2020	2021	2022	2023
Sweetwater	\$93.1	\$101.5	\$118.1	\$133.6	\$144.6	\$168.5	\$179.1	\$209.7
Sublette	\$26.3	\$28.6	\$33.3	\$37.7	\$40.8	\$47.5	\$50.5	\$59.1
County	2024	2025	2026	2027	2028	2029	2030	2031
Sweetwater	\$217.1	\$243.4	\$259.7	\$280.8	\$312.1	\$323.9	\$331.2	\$348.3
Sublette	\$61.2	\$68.6	\$73.3	\$79.2	\$88.0	\$91.3	\$93.4	\$98.2

## Coal and Trona (Soda Ash) Production

Sales value for coal was inserted into only the REMI Sweetwater County regional model to estimate economic impacts from coal production. No calibrations were deemed necessary for the coal analysis.

For trona, the soda ash revenue was also entered into only the REMI Sweetwater County regional model. For the trona analysis calibration, the labor productivity and compensation rates for Chemical Manufacturing (NAICS code 325) in Sweetwater County were reduced to be roughly consistent with REMI's historical trend and the U.S. Census Bureau's Economic Census results.

The coal and trona analyses were carried out separately. However, due to the small number of operators in the coal and trona industries, the inputs and the analysis results were aggregated for public release in order to avoid releasing potentially proprietary information.

The coal and trona production direct impact inputs to the REMI model totaled \$283.6 million (in 2014 dollars) for Alternative A (and all alternatives). The input amounts were the same for each year from 2016 to 2031 and were all allocated to Sweetwater County. The inputs for coal production were allocated to Coal Mining (NAICS code 2121), and for Trona, to Other Basic Inorganic Chemical Manufacturing (NAICS code 325180).

## Livestock Grazing

The total value of livestock production (estimated as described in Appendix N) was allocated based on an estimated distribution of billed animal unit months in 2015 to each of the socioeconomic study area counties, the rest of Wyoming, and outside Wyoming. The estimated distribution was prepared by a RSFO rangeland specialist based on the addresses of the permittee's base operations and the specialist's local knowledge, according to the primary (70%), secondary (20%), and tertiary (10%) locations where the specialist estimated each operator is most likely to purchase livestock supplies, services, and labor. The value of production was inputted into REMI's farm sector that includes all crop and ranching operations. There was no calibration for the farm sector.

Table O.4-5 shows the direct impact inputs to the REMI model by sector and county for Alternative A. The input amounts were the same for each year from 2016 to 2031. The inputs were allocated to a REMI sector that combines NAICS codes 111 (Crop Production) and 112 (Animal Production and Aquaculture).

**Table O.4-5. Inputs for Livestock Grazing – All Alternatives (millions of 2014\$)**

County	Amount
Fremont	\$0.30
Lincoln	\$0.35
Sublette	\$0.14
Sweetwater	\$4.43
Uinta	\$1.88
<b>Total</b>	<b>\$7.10</b>

## Recreation

The total direct economic expenditures were inserted into the REMI model to recreation-related industries based on estimation of recreation expenditure distributions from U.S. Forest Service National Visitor Use

Monitoring (NVUM) program data (see Appendix N). The disaggregation across counties was based on an analysis of site-level RMIS data by the RSFO. A RSFO recreation specialist estimated how recreation expenditures attributable to each site would accrue to the different counties based on the locations of the sites relative to socioeconomic study area communities and the types of recreation and visitors at each site.

Differences between Alternatives A and B were based on estimated reductions in recreation visits to the RSFO due to closure of the Killpecker Sand Dunes site under Alternative B. The BLM assumed that most of the economic activity attributable to visits to that site would be lost from the socioeconomic study area, and therefore deducted 100% of the visits to that site from the total visits. As a result, total visitation and recreation-related expenditures under Alternative B were estimated to be 86.6% of the visitation and expenditures under Alternative A. Due to the location of the Killpecker Sand Dunes within the RSFO and the socioeconomic study area, the BLM assumed the entire related economic change under Alternative B would occur in Sweetwater County. Therefore, the REMI model inputs for Alternative B changed for Sweetwater County only.

For recreation, the mapping of recreation expenditures from IMPLAN industries to REMI industries was particularly important. REMI does not have all same industries that were used in the IMPLAN analysis, so some of the expenditure data used in IMPLAN had to be combined before being input to a broader industry in REMI; e.g., “Other Retail.”

For calibration, the State assumed the margin value to be 34.6% for food stores and other retail trade, respectively, when related expenditures were inserted into the model based on data in IMPLAN.

Table O.4-6 and Table O.4-7 show the direct impact inputs to the REMI model by sector and county for Alternative A and Alternative B. The input amounts were the same for each year from 2016 to 2031. Note that for these tables only, the inputs are expressed in thousands of dollars instead of millions of dollars. (Therefore, for example, the total input for Sweetwater County in Alternative A equates to approximately \$19.6 million.)

**Table O.4-6. Inputs for Recreation – Alternative A (thousands of 2014\$)**

<b>Sector – NAICS Code</b>	<b>Fremont</b>	<b>Lincoln</b>	<b>Sublette</b>	<b>Sweetwater</b>	<b>Uinta</b>
Accommodation - 721	\$638.1	\$331.1	\$530.8	\$3,675.6	\$311.2
Food Services and Drinking Places - 722	\$450.0	\$233.5	\$374.4	\$2,592.4	\$219.5
Food and Beverage Stores - 4450	\$678.0	\$351.8	\$564.0	\$3,905.5	\$330.7
Other Retail - 4A0000 (REMI sector combining 9 NAICS codes)	\$1,407.2	\$730.1	\$1,170.6	\$8,105.9	\$686.3
Scenic and Sightseeing Transportation and Support Activities for Transportation - 48A000 (REMI sector combining NAICS codes 487 and 488)	\$9.2	\$4.8	\$7.6	\$52.8	\$4.5
Museums, Historical Sites, Zoos, and Parks - 7120	\$125.4	\$65.0	\$104.3	\$722.2	\$61.1
Other Amusement and Recreation Industries - 7139	\$97.2	\$50.4	\$80.8	\$559.6	\$47.4
<b>Total Input (Thousands)</b>	<b>\$3,405.0</b>	<b>\$1,766.6</b>	<b>\$2,832.6</b>	<b>\$19,614.0</b>	<b>\$1,660.7</b>



**Table O.4-7. Inputs for Recreation – Alternative B (thousands of 2014\$)**

<b>Sector – NAICS Code</b>	<b>Fremont</b>	<b>Lincoln</b>	<b>Sublette</b>	<b>Sweetwater</b>	<b>Uinta</b>
Accommodation - 721	\$638.1	\$331.1	\$530.8	\$2,939.8	\$311.2
Food Services and Drinking Places - 722	\$450.0	\$233.5	\$374.4	\$2,073.4	\$219.5
Food and Beverage Stores - 4450	\$678.0	\$351.8	\$564.0	\$3,123.6	\$330.7
Other Retail - 4A0000	\$1,407.2	\$730.1	\$1,170.6	\$6,483.2	\$686.3
Scenic and Sightseeing Transportation and Support Activities for Transportation - 48A000	\$9.2	\$4.8	\$7.6	\$42.2	\$4.5
Museums, Historical Sites, Zoos, and Parks - 7120	\$125.4	\$65.0	\$104.3	\$577.6	\$61.1
Other Amusement and Recreation Industries - 7139	\$97.2	\$50.4	\$80.8	\$447.6	\$47.4
<b>Total Input (Thousands)</b>	<b>\$3,405.0</b>	<b>\$1,766.6</b>	<b>\$2,832.6</b>	<b>\$15,687.5</b>	<b>\$1,660.7</b>

## O.5 RESULTS

Table O.5-1 through Table O.5-3 present results of the REMI-based impact analysis for Alternative A. Table O.5-4 through Table O.5-6 present the results for Alternative B. As mentioned above (Overview subsection of the Methodology chapter) the differences in inputs (and therefore results) for Alternatives C and D compared to Alternative A are minor, and therefore the REMI analysis was conducted only for Alternatives A and B. These tables present each alternative's results for direct and total economic output, total labor earnings, and total employment (jobs) for each resource use. They are identical in format to the IMPLAN-based tables in the alternative-specific subsections of the socioeconomics section of Chapter 4 of the EIS, except that these tables do not present the results for mineral taxes and federal mineral royalty revenues. Neither IMPLAN nor REMI were used to calculate those revenues so those figures are irrelevant to the discussions in this appendix.

Table O.5-7 through Table O.5-9 present summaries of the REMI results organized by three economic indicators: total economic output, total labor earnings, and total employment. For Alternatives A and B, these tables correspond to tables found in the "Summary of the Quantitative Economic Impact Analysis Results" subsection of Chapter 4 of the EIS. However, the tables below also differ; they include the percent difference between the REMI and IMPLAN results for the two alternatives. Also, the REMI analysis did not include the additional scenarios included in Chapter 4 of the EIS (Livestock Grazing under Total Authorized Use, Recreation Low Visitation, and Recreation Economic Contribution) so there are no tables below for those scenarios.

REMI also produces estimates of the population associated with an economic impact, and how the population changes over time. However, REMI's population estimates appear to align with a "shock" or new activity setting rather than an economic contribution (existing activity) setting. For example, REMI results show estimated population increasing over the first several years due to the model assuming migrants would enter the region to fill new jobs. However, for most of the economic activity analyzed in this EIS, most of the jobs already exist. For instance, there are no new jobs created under Alternative A for grazing, coal and trona production, and recreation. Even for oil and gas development and production, much of the economic activity from new well drilling and production is ongoing "renewal" of activity associated with recent patterns of activity. Therefore, the State, in consultation with the BLM team, determined that REMI's population estimates are not appropriate for the modeling context in this analysis and therefore they are not included in this appendix.

**Table O.5-1. REMI Results: Total Annual Impacts by Program, 2016, Alternative A (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$7,094	\$561,074	\$450,660	\$283,578	\$29,279	<b>\$1,331,685</b>
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	<b>N.A.</b>
Total Economic Output	\$8,843	\$668,110	\$899,852	\$380,065	\$32,733	<b>\$1,989,603</b>
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	<b>N.A.</b>
Total Labor Earnings	\$1,870	\$277,766	\$79,990	\$77,420	\$9,106	<b>\$446,152</b>
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	<b>N.A.</b>
Jobs	115	3,106	953	809	274	<b>5,256</b>
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	<b>N.A.</b>

<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Initial values; these would increase each year from 2016 due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties

**Table O.5-2. REMI Results: Net Present Value (3% Discount Rate) by Program, 2016–2031, Alternative A (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$89,114	\$7,047,714	\$12,469,766	\$3,562,057	\$367,775	<b>\$23,536,427</b>
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	<b>N.A.</b>
Total Economic Output	\$103,456	\$8,075,373	\$24,646,868	\$4,642,287	\$388,191	<b>\$37,856,174</b>
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	<b>N.A.</b>
Total Labor Earnings	\$21,844	\$3,426,290	\$2,133,314	\$940,072	\$108,059	<b>\$6,629,578</b>
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	<b>N.A.</b>
Average Jobs Per Year	98	2,835	1,971	707	236	<b>5,847</b>

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Incorporates annual increases in production due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties

**Table O.5-3. REMI Results: Net Present Value (7% Discount Rate) by Program, 2016–2031, Alternative A (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$67,019	\$5,300,274	\$8,735,008	\$2,678,866	\$276,587	<b>\$17,057,755</b>
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	<b>N.A.</b>
Total Economic Output	\$78,127	\$6,090,314	\$17,268,726	\$3,499,202	\$293,054	<b>\$27,229,422</b>
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	<b>N.A.</b>
Total Labor Earnings	\$16,612	\$2,587,695	\$1,499,628	\$711,197	\$81,926	<b>\$4,897,058</b>
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	<b>N.A.</b>
Average Jobs Per Year	98	2,835	1,971	707	236	<b>5,847</b>
% Difference from Alt. A	N.A.	N.A.	N.A.	N.A.	N.A.	<b>N.A.</b>

<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Incorporates annual increases in production due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties

**Table O.5-4. REMI Results: Total Annual Impacts by Program, 2016, Alternative B (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$7,094	\$149,581	\$119,397	\$283,578	\$25,352	<b>\$585,002</b>
% Difference from Alt. A	0.0%	-73.3%	-73.5%	0.0%	-13.4%	<b>-56.1%</b>
Total Economic Output	\$8,843	\$177,988	\$238,583	\$380,065	\$28,342	<b>\$833,821</b>
% Difference from Alt. A	0.0%	-73.4%	-73.5%	0.0%	-13.4%	<b>-58.1%</b>
Total Labor Earnings	\$1,870	\$73,752	\$21,205	\$77,420	\$7,884	<b>\$182,131</b>
% Difference from Alt. A	0.0%	-73.4%	-73.5%	0.0%	-13.4%	<b>-59.2%</b>
Jobs	115	829	253	809	237	<b>2,244</b>
% Difference from Alt. A	0.0%	-73.3%	-73.4%	0.0%	-13.4%	<b>-57.3%</b>

<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Initial values; these would increase each year from 2016 due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties

**Table O.5-5. REMI Results: Net Present Value (3% Discount Rate) by Program, 2016–2031, Alternative B (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$89,114	\$1,878,902	\$3,305,418	\$3,562,057	\$318,454	<b>\$9,153,944</b>
% Difference from Alt. A	0.0%	-73.3%	-73.5%	0.0%	-13.4%	<b>-61.1%</b>
Total Economic Output	\$103,456	\$2,144,903	\$6,530,700	\$4,642,287	\$336,080	<b>\$13,757,427</b>
% Difference from Alt. A	0.0%	-73.4%	-73.5%	0.0%	-13.4%	<b>-63.7%</b>
Total Labor Earnings	\$21,844	\$909,897	\$563,574	\$940,072	\$93,508	<b>\$2,528,895</b>
% Difference from Alt. A	0.0%	-73.4%	-73.6%	0.0%	-13.5%	<b>-61.9%</b>
Average Jobs Per Year	98	756	523	707	205	<b>2,288</b>

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
% Difference from Alt. A	0.0%	-73.3%	-73.5%	0.0%	-13.4%	<b>-60.9%</b>

<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Incorporates annual increases in production due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties

**Table O.5-6. REMI Results: Net Present Value (7% Discount Rate) by Program, 2016–2031, Alternative B (1,000s of 2014\$)**

	Livestock Grazing (Billed Use) <sup>1</sup>	Oil and Gas Well Development <sup>1</sup>	Oil and Gas Production <sup>2</sup>	Coal and Soda Ash Production <sup>1,3</sup>	Recreation (High Visitation) <sup>1</sup>	Total BLM-Supported
Direct Economic Output	\$67,019	\$1,413,039	\$2,315,364	\$2,678,866	\$239,495	<b>\$6,713,783</b>
% Difference from Alt. A	0.0%	-73.3%	-73.5%	0.0%	-13.4%	<b>-60.6%</b>
Total Economic Output	\$78,127	\$1,617,991	\$4,575,795	\$3,499,202	\$253,716	<b>\$10,024,830</b>
% Difference from Alt. A	0.0%	-73.4%	-73.5%	0.0%	-13.4%	<b>-63.2%</b>
Total Labor Earnings	\$16,612	\$687,041	\$396,280	\$711,197	\$70,893	<b>\$1,882,023</b>
% Difference from Alt. A	0.0%	-73.4%	-73.6%	0.0%	-13.5%	<b>-61.6%</b>
Average Jobs Per Year	98	756	523	707	205	<b>2,288</b>
% Difference from Alt. A	0.0%	-73.3%	-73.5%	0.0%	-13.4%	<b>-60.9%</b>

<sup>1</sup> Based on the available data, the analysis assumes a constant annual activity level.

<sup>2</sup> Incorporates annual increases in production due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

FMR: Federal Mineral Royalties

**Table O.5-7. REMI Results: Total Economic Output by Program by Alternative (1,000s of 2014\$)**

	Alt. A REMI Result	Alt. B REMI Result	Alt. A Difference from IMPLAN Result	Alt. B Difference from IMPLAN Result
<b>Annual Impact, 2016</b>				
Livestock Grazing (Billed Use) <sup>1</sup>	\$8,843	\$8,843	-32%	-32%
Oil and Gas Development <sup>1</sup>	\$668,110	\$177,988	-4%	-4%
Oil and Gas Production <sup>2</sup>	\$899,852	\$238,583	67%	67%
Coal and Soda Ash Production <sup>1,3</sup>	\$380,065	\$380,065	-15%	-15%
Recreation (High Visitation) <sup>1</sup>	\$32,733	\$28,342	-9%	-9%
<b>Total BLM-Supported</b>	<b>\$1,989,603</b>	<b>\$833,821</b>	<b>15%</b>	<b>1%</b>
<b>Net Present Value, 2016–2031 (3% Discount Rate)</b>				
Livestock Grazing (Billed Use) <sup>1</sup>	\$103,456	\$103,456	-37%	-37%
Oil and Gas Development <sup>1</sup>	\$8,075,373	\$2,144,903	-8%	-8%
Oil and Gas Production <sup>1,3</sup>	\$24,646,868	\$6,530,700	65%	65%
Coal and Soda Ash Production <sup>1,3</sup>	\$4,642,287	\$4,642,287	-18%	-18%
Recreation (High Visitation) <sup>1</sup>	\$388,191	\$336,080	-14%	-14%
<b>Total BLM-Supported</b>	<b>\$37,856,174</b>	<b>\$13,757,427</b>	<b>26%</b>	<b>10%</b>
<b>Net Present Value, 2016–2031 (7% Discount Rate)</b>				
Livestock Grazing (Billed Use) <sup>1</sup>	\$78,127	\$78,127	-37%	-37%
Oil and Gas Development <sup>1</sup>	\$6,090,314	\$1,617,991	-7%	-8%
Oil and Gas Production <sup>4</sup>	\$17,268,726	\$4,575,795	65%	65%
Coal and Soda Ash Production <sup>1,3</sup>	\$3,499,202	\$3,499,202	-18%	-18%
Recreation (High Visitation) <sup>1</sup>	\$293,054	\$253,716	-14%	-14%
<b>Total BLM-Supported</b>	<b>\$27,229,422</b>	<b>\$10,024,830</b>	<b>25%</b>	<b>9%</b>

<sup>1</sup> Assumes constant annual activity level (based on available data).

<sup>2</sup> Would rise each year from 2016 due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

<sup>4</sup> Incorporates annual increases in production.

**Table O.5-8. REMI Results: Total Labor Earnings by Program by Alternative (1,000s of 2014\$)**

	Alt. A REMI Result	Alt. B REMI Result	Alt. A Difference from IMPLAN Result	Alt. B Difference from IMPLAN Result
<b>Annual Impact, 2016</b>				
Livestock Grazing (Billed Use) <sup>1</sup>	\$1,870	\$1,870	-58%	-58%
Oil and Gas Development <sup>1</sup>	\$277,766	\$73,752	13%	13%
Oil and Gas Production <sup>2</sup>	\$79,990	\$21,205	84%	85%
Coal and Soda Ash Production <sup>1,3</sup>	\$77,420	\$77,420	-2%	-2%
Recreation (High Visitation) <sup>1</sup>	\$9,106	\$7,884	16%	16%
<b>Total BLM-Supported</b>	<b>\$446,152</b>	<b>\$182,131</b>	<b>18%</b>	<b>9%</b>
<b>Net Present Value, 2016–2031 (3% Discount Rate)</b>				
Livestock Grazing (Billed Use) <sup>1</sup>	\$21,844	\$21,844	-61%	-61%
Oil and Gas Development <sup>1</sup>	\$3,426,290	\$909,897	11%	11%
Oil and Gas Production <sup>4</sup>	\$2,133,314	\$563,574	78%	77%
Coal and Soda Ash Production <sup>1,3</sup>	\$940,072	\$940,072	-5%	-5%
Recreation (High Visitation) <sup>1</sup>	\$108,059	\$93,508	10%	10%
<b>Total BLM-Supported</b>	<b>\$6,629,578</b>	<b>\$2,528,895</b>	<b>22%</b>	<b>11%</b>
<b>Net Present Value, 2016–2031 (7% Discount Rate)</b>				
Livestock Grazing (Billed Use) <sup>1</sup>	\$16,612	\$16,612	-61%	-61%
Oil and Gas Development <sup>1</sup>	\$2,587,695	\$687,041	12%	11%
Oil and Gas Production <sup>4</sup>	\$1,499,628	\$396,280	78%	78%
Coal and Soda Ash Production <sup>1,3</sup>	\$711,197	\$711,197	-4%	-4%
Recreation (High Visitation) <sup>1</sup>	\$81,926	\$70,893	11%	11%
<b>Total BLM-Supported</b>	<b>\$4,897,058</b>	<b>\$1,882,023</b>	<b>22%</b>	<b>11%</b>

<sup>1</sup> Assumes constant annual activity level (based on available data).

<sup>2</sup> Would rise each year from 2016 due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

<sup>4</sup> Incorporates annual increases in production.

**Table O.5-9. REMI Results: Total Employment by Program by Alternative**

	Alt. A REMI Result	Alt. B REMI Result	Alt. A Difference from IMPLAN Result	Alt. B Difference from IMPLAN Result
<b>Annual Impact, 2016</b>				
Livestock Grazing (Billed Use) <sup>1</sup>	115	115	-13%	-13%
Oil and Gas Development <sup>1</sup>	3,106	829	-10%	-10%
Oil and Gas Production <sup>2</sup>	953	253	75%	75%
Coal and Soda Ash Production <sup>1,3</sup>	809	809	-19%	-19%
Recreation (High Visitation) <sup>1</sup>	274	237	-16%	-16%
<b>Total BLM-Supported</b>	<b>5,256</b>	<b>2,244</b>	<b>-3%</b>	<b>-9%</b>

<sup>1</sup> Assumes constant annual activity level (based on available data).

<sup>2</sup> Would rise each year from 2016 due to increasing number of wells in production.

<sup>3</sup> Values combined to protect confidentiality of data from individual operators.

Net present value is not applicable for employment.

## O.6 DISCUSSION

### O.6.1 General Comparisons

Some amount of difference between the REMI and IMPLAN results is to be expected. As shown in Table O.5-7 through Table O.5-9 for the key economic indicators of total economic output, total labor earnings, and total employment, the differences between the REMI and IMPLAN results are generally not large. There are no “order of magnitude” differences. In most cases, the estimates are within 25%, which is very reasonable given the many considerations involved in economic impact modeling. The greatest differences are for grazing and oil and gas production. These may be explained by methodological factors described below rather than any inherent “error” in either model.

Different from a standard static input-output model like IMPLAN, REMI P+ is a dynamic policy analysis model with forecasts and simulations generated on an annual basis to include behavioral responses to, or interactions among, wage, price, and many other economic factors. The dynamic modeling framework forecasts how changes in the economy and adjustment to these changes will occur on a year by year basis. The dynamic aspects are best illustrated graphically, and the following figures and discussion illustrate these aspects for oil and gas development. The same positive or negative slope of the graphed REMI line for each economic indicator pertains across all the resource uses, with one exception. The only exception is for oil and gas production. For this resource use only, the direct impact used as the input to the model – in this case, total sales value of oil and gas – changes every year. Specifically, it increases every year because more wells come into production. This increase overwhelms some of the trends described below.

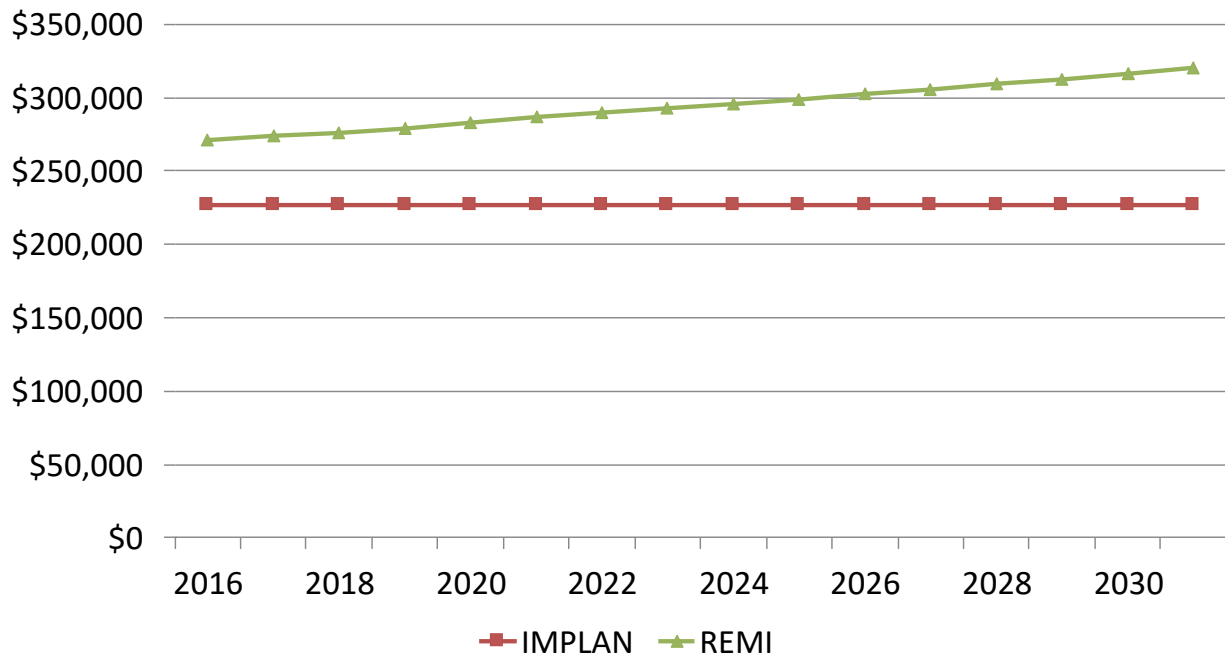
REMI assumes labor productivity (economic output per job) increases over time for all sectors of the economy (Figure R.6-1). Accordingly, given the constant annual inputs in this EIS for all activities except oil and gas production, the results show decreases in employment impacts each year for the whole forecasting period (Figure R.6-2 for direct employment, and Figure R.6-3 for total employment). The impacts on total earnings also generally decline as measured in constant dollars (Figure R.6-4), but the AEPJ always increase due to competition for labor and efficiency gains in business operations, which



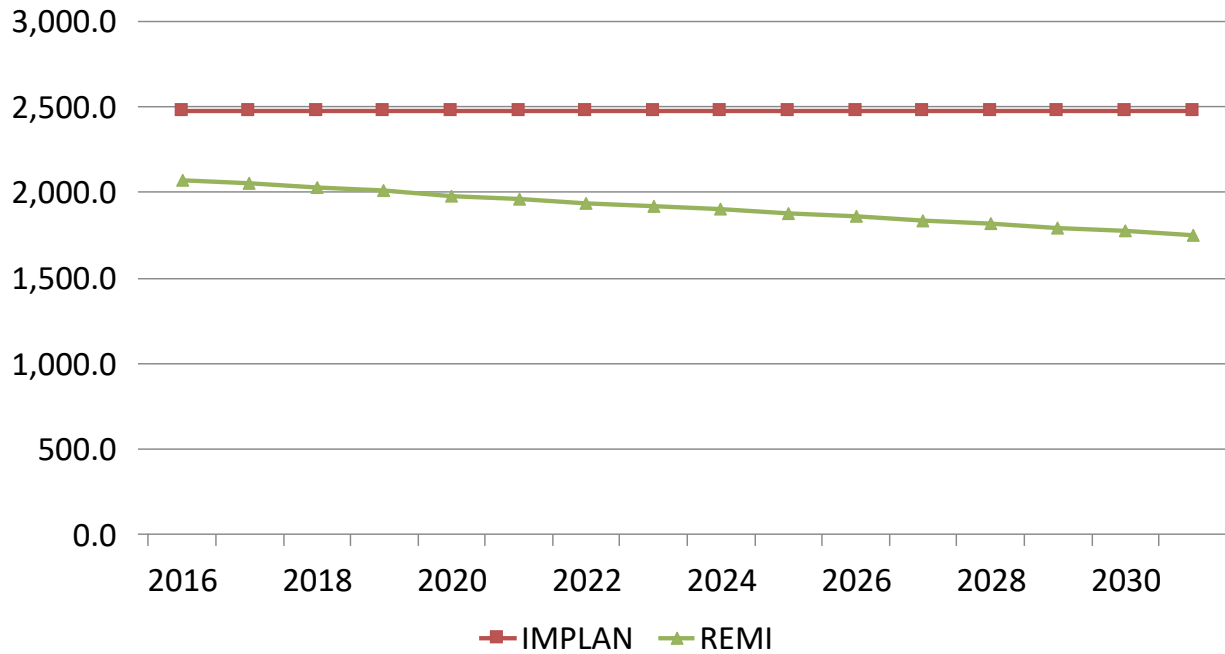
together motivate or allow employers to increase wages (Figure R.6-5). However, the impacts to total economic output always decline at a decreasing rate during the first half of the forecasting period (Figure R.6-6), but then stabilize. The possible reason is that the model assumes there are more economic activities at the early stages after an economic input change (in spite of the adjustments made in the modeling approach to better reflect a contribution analysis rather than a shock analysis), either through supply chain effects or local consumption demand.

The following subsections address the differences in results for specific resources uses (as shown in Table O.5-7 through Table O.5-9 above), and possible explanations for differences. In these discussions, any difference of 25% or less is considered “close” given the many considerations involved in economic impact modeling. Nonetheless, possible factors affecting the respective model results are addressed for all resource uses.

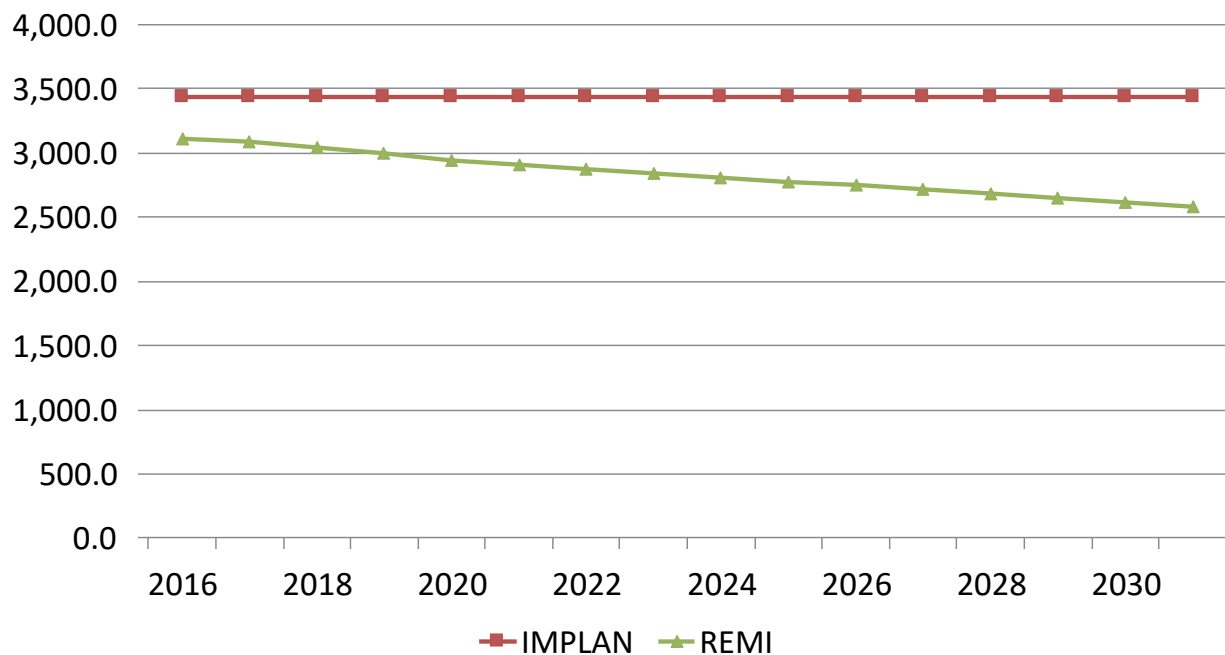
**Figure O.6-1. Direct Labor Productivity (Output/Job) for Oil and Gas Development, REMI and IMPLAN (2014\$)**



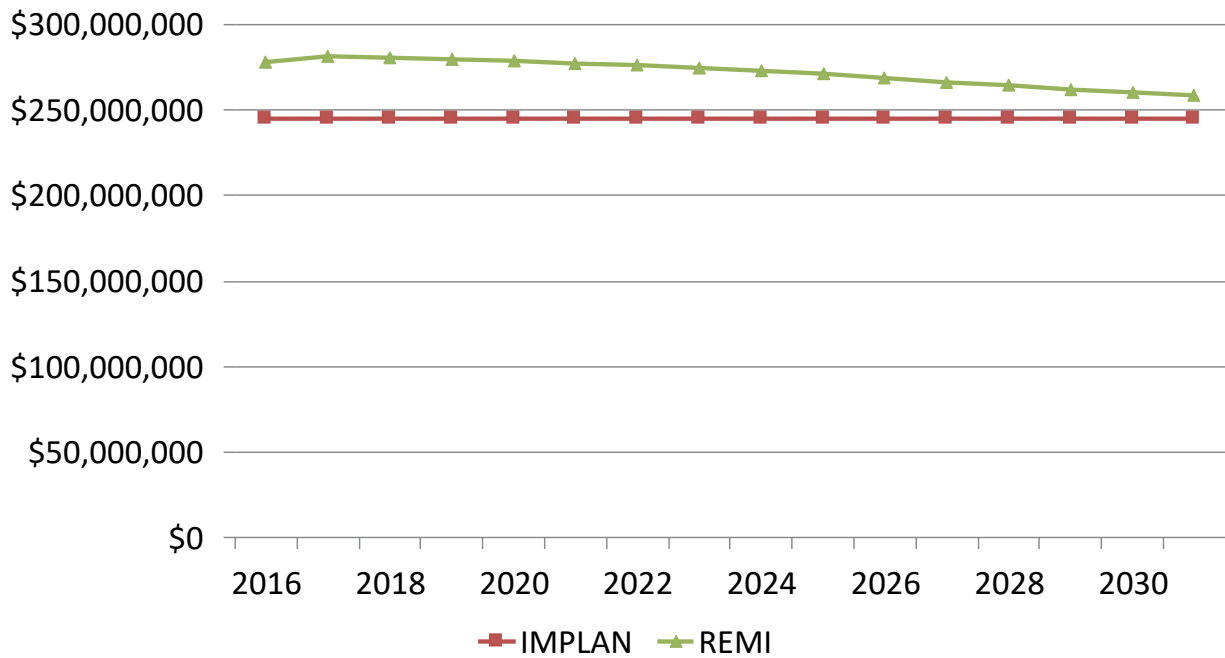
**Figure R.6-2. Direct Employment (Jobs) for Oil and Gas Development, REMI and IMPLAN**



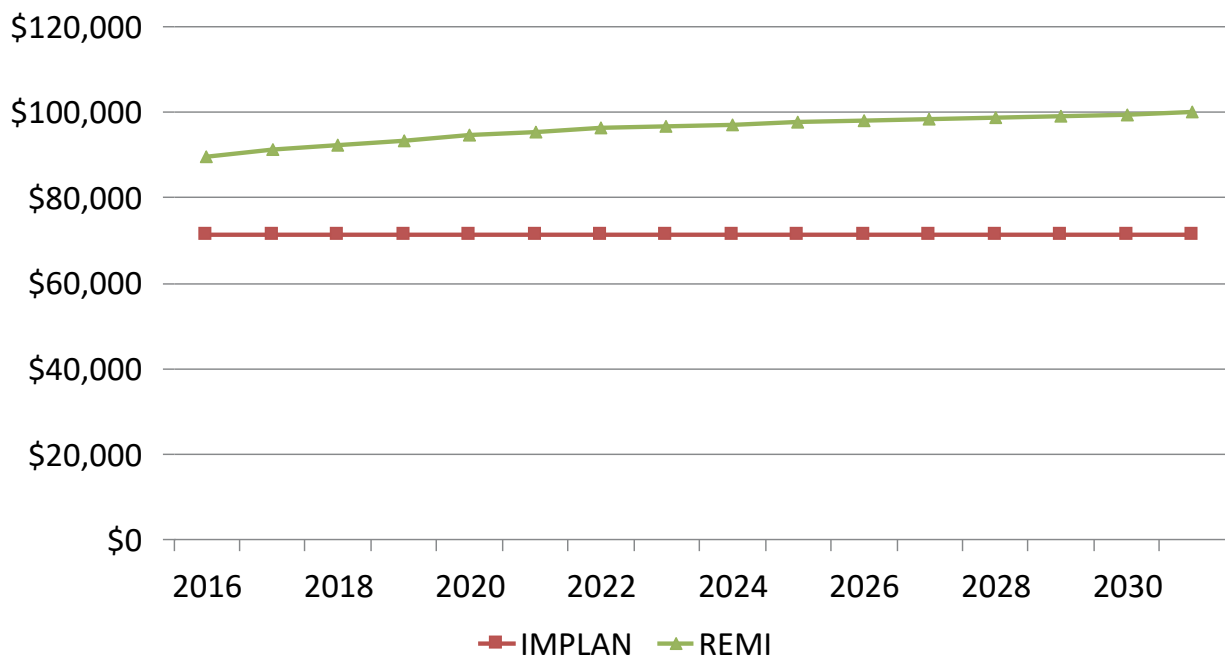
**Figure R.6-3. Total Employment (Jobs) for Oil and Gas Development, REMI and IMPLAN**



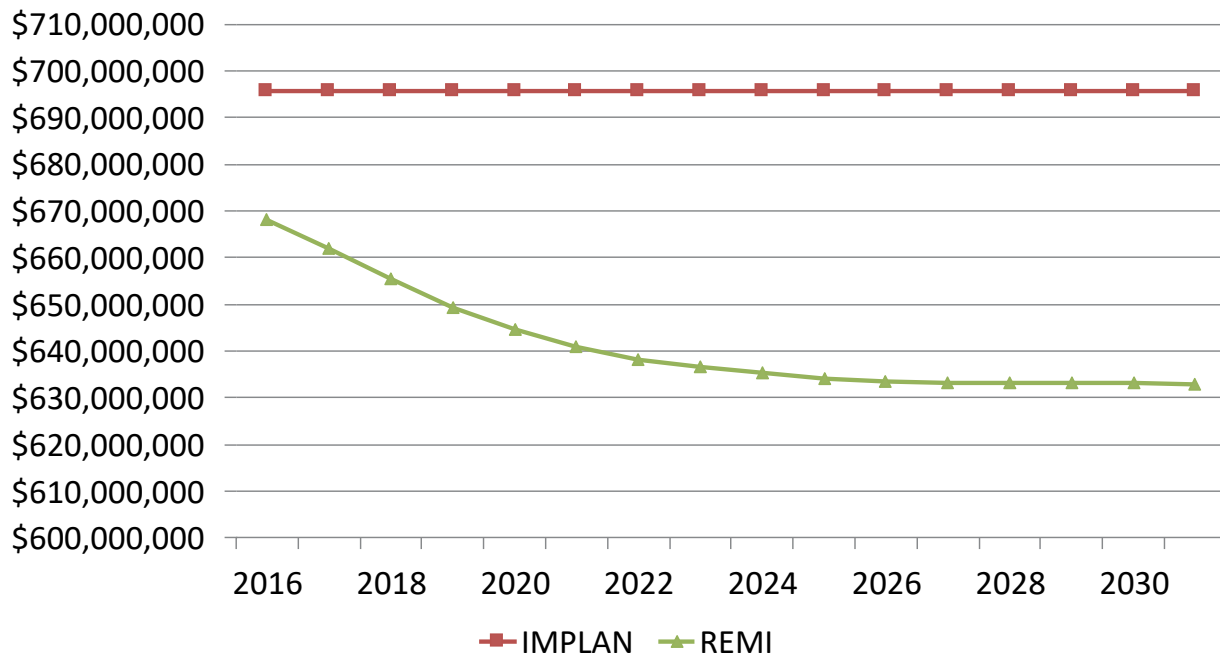
**Figure R.6-4. Total Earnings for Oil and Gas Development, REMI and IMPLAN (2014\$)**



**Figure R.6-5. Average Total Earnings per Job for Oil and Gas Development, REMI and IMPLAN (2014\$)**



**Figure R.6-6. Total Output for Oil and Gas Development, REMI and IMPLAN (2014\$)**



**Recreation**

The REMI and IMPLAN results for recreation were close (within 25%) across all three economic indicators (total output, total earnings, and total employment).

Mapping of inputs to different sectors in the two models may be an important source of differences in the results. For example, gasoline is an expenditure category in the NVUM data, and IMPLAN has a specific industry sector for Gasoline Stations. This expenditure category/industry has the largest amount of spending in the NVUM data, comprising 32.6% of the total expenditures. The REMI model does not have a specific industry sector for gasoline stations. Therefore, the REMI analysis had to lump gasoline expenditures into a sector for Other Retail. It is highly likely that the economic relationships within the model for that generalized sector do not closely match the relationships that pertain to Gasoline Stations specifically. For instance, labor productivity and AEPJ probably differ, which would affect the employment and earnings results.

**Grazing**

The total annual employment estimated by the two models for livestock grazing was close (13% less in REMI). The estimates for total output and total earnings were further apart (annually, 32% less in REMI for total output, and 58% less in REMI for total earnings).

Neither model has a specific sector for cattle ranching. IMPLAN has a sector titled “Cattle Ranching and Farming,” but this sector includes feedlots and dairy cattle operations. Given the broad scope of this sector, and because cattle ranching budgets specific to cattle operations that use public lands as an important production input are available from the universities of Wyoming and Idaho, the IMPLAN analysis uses “analysis by parts” methodology, which means allocating the value of production to other specific industries

based on the break-down of a typical ranch operation budget drawn from the economic literature, as described in Appendix N.

The REMI model owned by the State does not have enough granularity to allow for analysis by parts methodology. Therefore, in the REMI analysis the value of production was allocated to a combined crop production and animal production sector. The parameters (economic relationships) of this generalized sector in the REMI model may not match very well with the actual economic relationships specific to cattle ranching in Wyoming or the results of the analysis by parts methodology in IMPLAN.

In addition, analysis of economic impacts in agriculture is always challenging because farm sector earnings are very volatile (highly variable each year). In fact, net farm earnings are sometimes negative. Economic models must make adjustments to account for volatility in order to make reasonable projections. The two models probably make different assumptions about how to handle this issue.

### **Coal and Trona (Soda Ash)**

For coal and trona, the IMPLAN and REMI results were close for total output and total earnings. The specific numbers cannot be released due to their potential to reveal proprietary data. The results for direct and total employment were somewhat further apart, but still not remarkably so.

For coal, a possible source of differences lies in the AEPJ and employment multipliers. REMI used a higher AEPJ than IMPLAN and had a higher multiplier. The AEPJ in the coal industry itself (direct impact) would be high, but if the industry supports a large number of jobs in other industries, which would have lower wages, it is not clear why the total AEPJ is as high as it is according to REMI.

A likely source of differences in results for the trona and soda ash industry is a difference in accounting for the linkage between the mining and processing segments of trona/soda ash production. The industry is vertically integrated across these segments. Input-output models assume separation between industries, and the purchase coefficients are calibrated accordingly. Therefore, the methodology for IMPLAN included breaking the link between these segments. Specifically, the soda ash revenue was entered into the IMPLAN model, Sector 164, Other Basic Inorganic Chemical Manufacturing to estimate the total economic impact of soda ash production. The total economic impact of trona mining was estimated separately by entering only the trona mining revenue into the IMPLAN model, Sector 33, Potash, Soda, and Borate Minerals, after removing the linkage between Sector 164 and Sector 33 from the Sector 164 industry production account in the IMPLAN model. Removing the linkage eliminates double-counting of the impacts from trona revenue. For REMI, only one industry sector, Other Basic Inorganic Chemical Manufacturing (NAICS code 325180), was applicable to inputs for the combined trona/soda ash industry. Thus, the linkage in the vertically integrated trona/soda industry could not be directly addressed. In addition, the higher-level sector used for REMI's results outputs represents a much broader industry than the two specific sectors used in IMPLAN, and therefore the economic relationships between the more generic industry and its supporting industries are different from the relationships between the two industries used in IMPLAN and their supporting industries.

### **Oil and Gas Development**

The REMI and IMPLAN results for oil and gas development were close (within 25%) across all three economic indicators (total output, total earnings, and total employment). This may reflect the fact that the input sectors available in both models were identical. It is also notable that other "intermediate" indicators reviewed by the modeling team – multipliers, AEPJ, and labor productivity – were all close between the two models.

## Oil and Gas Production

As shown in the results tables above, the differences between the REMI and IMPLAN results were greatest for oil and gas production. These differences may be attributable to methodology and data source considerations.

Both REMI and IMPLAN “out of the box” use data from the BEA to quantify the total number of local jobs in each industry, including the Oil and Gas Extraction sector. However, the BEA employment data for this sector is known to be artificially inflated because it includes large numbers of sole proprietors in this sector. This is probably because it counts individual people who receive royalties or rents from oil and gas companies as sole proprietorships and therefore as workers in this sector. But most of the actual jobs in this sector are wage jobs provided by medium and large-sized oil and gas extraction corporations. People who receive royalties or rents only because they own mineral estate are not actually laborers in the sector. Therefore, prior to impact analysis both models require calibration of this sector to reduce potential errors from the large number of sole proprietors included in the BEA data.

The calibrations of the Oil and Gas Extraction sector for the two models in this study used different methodologies for what was adjusted and how, and different data sources for the adjustments. The calibration for IMPLAN was based on data from the BLS. The BLS data does not include sole proprietors who are not actually laborers. The calibration for REMI used data from the U.S. Census Bureau’s Economic Census, which is also more accurate than the BEA data with respect to sole proprietors. These two data sources are based on different time periods. This is a potential issue because the price of oil and gas has varied considerably in recent years. Thus, even with a roughly constant level of production, the total sales value (output) of the Oil and Gas Extraction sector can vary significantly from year to year. Thus, the two calibrated models may have very different figures for economic parameters such as labor productivity (output per worker).

In short, for oil and gas production, both models were adjusted to address an important known issue, but there were several key differences – in methodology and in data sources – that could have still resulted in the differences between the results.

## Conclusions

Based on the reasonable effort made toward an apples-to-apples comparison in this REMI Pilot Project, the differences in results between the IMPLAN and REMI models are not so great that they would lead to different management decisions (selection of a different preferred alternative) if REMI were used for the economic analysis instead of IMPLAN. They do not tell decisively different economic stories about the nature of the local economy or the alternatives.

While the results for most of the resource uses were reasonably close, one might ask why the larger differences for the livestock grazing and oil and gas production results are not decisive. There are at least two answers to this question.

First, when evaluating the economic differences between alternatives, it is the relative differences between the alternatives that are most important, not the absolute dollars or job numbers. This is in part because all economic models are imperfect in their characterization of an economy, and economic conditions change in any case, so the actual numerical results in the future are likely to differ from the forecasts of any particular model. However, each model is internally consistent, so any imperfections will at least be consistently applied across the alternatives. Therefore, the relative differences in the model results across alternatives are of greater interest for decision making than the absolute levels of output, earnings, or jobs predicted for each alternative. Clearly, the differences between Alternatives A and B from either the IMPLAN or REMI model are much greater than the difference between the results. That is, both models

show that the economic indicators for Alternative B are well more than 50% less than the values of the indicators for Alternative A, whereas the predicted differences from the REMI model are just a few percentage points higher than the differences predicted by the IMPLAN model when evaluated across all resource uses, and are almost exactly the same when evaluated for each specific resource use.<sup>3</sup> Either model leads to the same understanding of the large differences in the economic impacts of Alternatives A and B.

Second, economic impacts measurable in models such as REMI and IMPLAN are only one factor that the BLM must take into account in making land use decisions. Other factors are equally or more important, such as the degree to which each alternative meets the various and many management goals and policies that the BLM must address in making land use decisions.

The REMI Pilot Project has also produced a number of observations about the nature of the REMI and IMPLAN models and considerations in the modeling process. Here are some of the observations of the project team:

- REMI is useful for showing how an economy is a dynamic entity. The kinds of dynamics described briefly in Section R.6.1 are almost certainly a more realistic way of portraying an economy over a long planning period than the application of a static model like IMPLAN. However, for the reasons noted above, employing a dynamic model does not necessarily provide more useful or accurate results for the purposes of the BLM land use planning process.<sup>4</sup>
- Careful calibration of either model is required. Both models “out of the box” have some features that are not accurate for the southwest Wyoming economy. This is almost certainly true for other locations in the western United States.
- Differences in definitions of study area geographies are of interest, but depending on context are probably not that important to the results. In this particular case, the IMPLAN model was specified and applied for a combined area consisting of the five counties of the socioeconomic study area. The BLM considered this approach efficient and adequate for the purposes of the RMP/EIS analysis. The REMI model owned by the State could only be applied at the level of each county. This created extra work in specifying the inputs as the county level, and in aggregating the results for comparison to the IMPLAN results. The project team did some tests to determine the sensitivity of the results to the county-level disaggregation (for instance, putting all inputs into Sweetwater County only vs. distributing them to the five counties based on the best available information for making the distribution). The tests indicated that the REMI results were not very sensitive to the county-level distribution of the inputs.
- Differences in industrial sector definitions between the two models may be very important. For instance, REMI does not have the degree of sector granularity to allow use of analysis by parts methodology for the livestock grazing analysis. This meant that the REMI analysis had to use a higher-level sector for the inputs, and the economic relationships of that sector to other sectors in the economy may not reflect actual relationships of cattle ranching operations to other sectors of the southwest Wyoming economy. In addition, not being able to apply the analysis by parts methodology for livestock grazing meant that local data (from the universities of Wyoming and Idaho) specific to cattle ranching in the region could not be applied in the REMI analysis. The recreation analysis provides another example. Gasoline stores are one of the larger expenditure

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<sup>3</sup> Another way of putting this is that it is the model inputs that are decisive, not the selection of the model. When one “turns the crank” on each model, the differences in results largely trace to the differences in the inputs, not the workings of the models. The physical outputs of the uses of BLM-administered land are equal for both models, and the direct economic impacts, which are estimated outside of the models, are equal as well.

<sup>4</sup> REMI is also a considerably more expensive model to obtain, and many fewer socioeconomic analysts within and outside of the BLM have the expertise necessary to use it properly.

categories for recreation-related expenditures. This could be directly addressed in the IMPLAN model by using an industrial sector specific to gasoline stores, but in the REMI model expenditures at gasoline stores had to be lumped in with expenditures for several other types of retail establishments.

- REMI is more of a “black box” model. Not all of the modeling issues that emerged in this pilot project could be resolved in this demonstration project. Because of the REMI model’s complexity, it is harder to “get under the hood” to make manual changes to calibrate the model for the local economy. In addition, some of the changes that are routinely made in use of the IMPLAN model simply cannot be made in the REMI model.

In summary, the REMI Pilot Project has been a revealing trial of a model not usually used by the BLM. It has highlighted the importance of a number of specific considerations in the economic impact modeling process. The BLM will be able to make use of these considerations in future impact modeling, whatever impact model is used.



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# APPENDIX P—AIR QUALITY TECHNICAL SUPPORT DOCUMENT

## P.1 INTRODUCTION

This Air Quality Technical Support Document describes the processes used to conduct the air quality impact assessment and provides summaries of relevant analysis data. This document served as the basis for air quality impact analyses of all alternatives. The contents of this document are:

- Climate Resources
- Regulatory Framework
- Thresholds of Significance
- Air Quality Impact Analysis
- Emission Calculations
- Resources and References.

## P.2 CLIMATE RESOURCES

Climate is the combination of temperature, humidity, atmospheric pressure, wind, precipitation, and other meteorological characteristics over a long period of time in a specific region. Climate differs from weather, which is the present condition of these characteristics and their variations over shorter periods. Climate change involves long-term trends indicating a noticeable shift in climate. Primary climate indicators that can be monitored include ambient air temperature, atmospheric pressure, wind, relative humidity, precipitation amounts and timing, annual snowpack levels, streamflow volume and timing, and solar radiation.

The planning area is buffeted by high to moderate predominant westerly winds with low precipitation and relative humidity. Climate in the planning area is designated as temperate, semi-arid with long cold winters and warm summers. Table P-P-1, Rock Springs Station Temperature and Precipitation Data, details the average, maximum, and minimum mean temperate and annual total precipitation for the Rock Springs area.

**Table P-P-1. Rock Springs Station Temperature and Precipitation Data (2007 to 2017)**

Year	Total Precipitation (inches)	Average Mean Temperature*	Mean Maximum Temperature*	Mean Minimum Temperature*
2007	7.15	45.0	57.3	32.7
2008	6.05	41.9	53.8	29.9
2009	8.11	42.7	54.8	30.7
2010	7.17	43.2	55.3	31.1
2011	8.73	-	-	-
2012	3.15	47.2	59.9	34.5
2013	4.68	44.0	55.8	32.3
2014	4.25	45.4	57.4	33.3
2015	8.63	45.9	57.6	34.2
2016	7.46	44.8	56.5	33.0

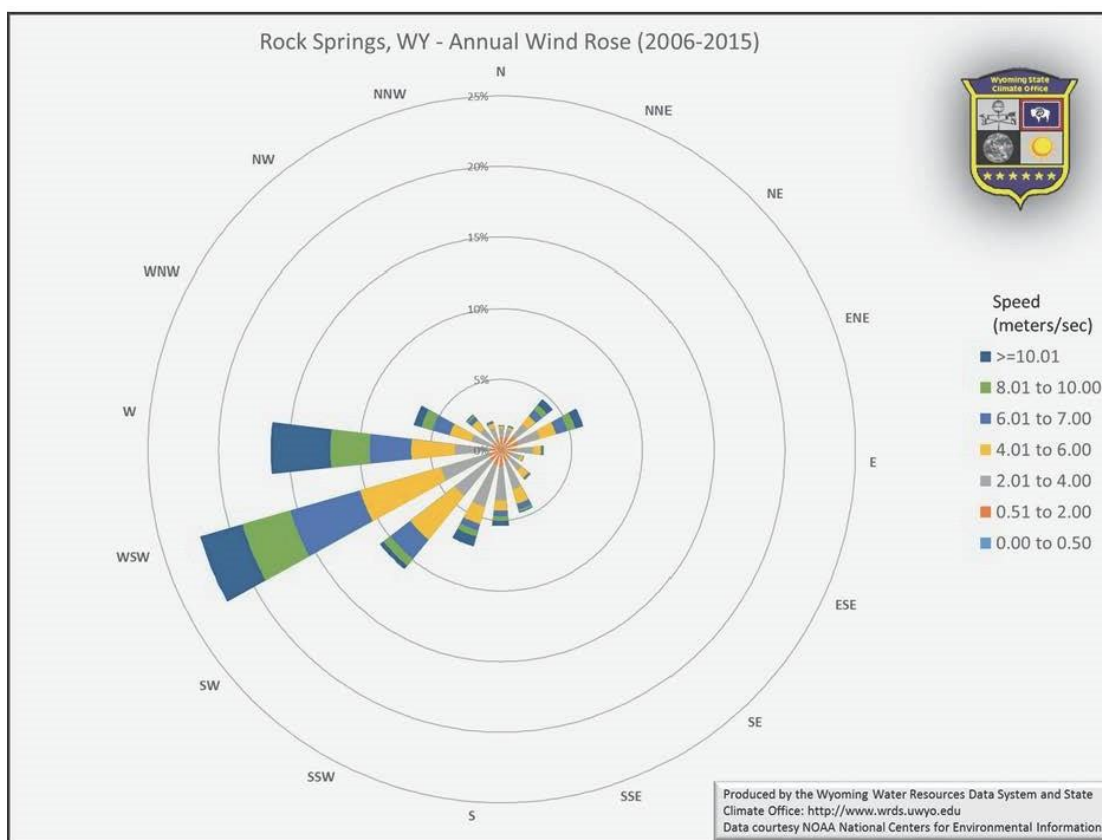
Year	Total Precipitation (inches)	Average Mean Temperature*	Mean Maximum Temperature*	Mean Minimum Temperature*
2017	5.59	45.0	56.8	33.2

\* degrees Fahrenheit

Source: National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI)  
<https://www.ncdc.noaa.gov/cdo-web/>

The daily annual wind speed average is 11.4 mph with a high to moderate prevailing westerly winds (Western Regional Climate Center, 2009). Air quality in the area is influenced by high winds that can transport air pollutants and dust from industrial sources and metropolitan areas from the west. The predominant wind direction near Rock Springs is from the west-southwest as shown in Figure P-P-1.

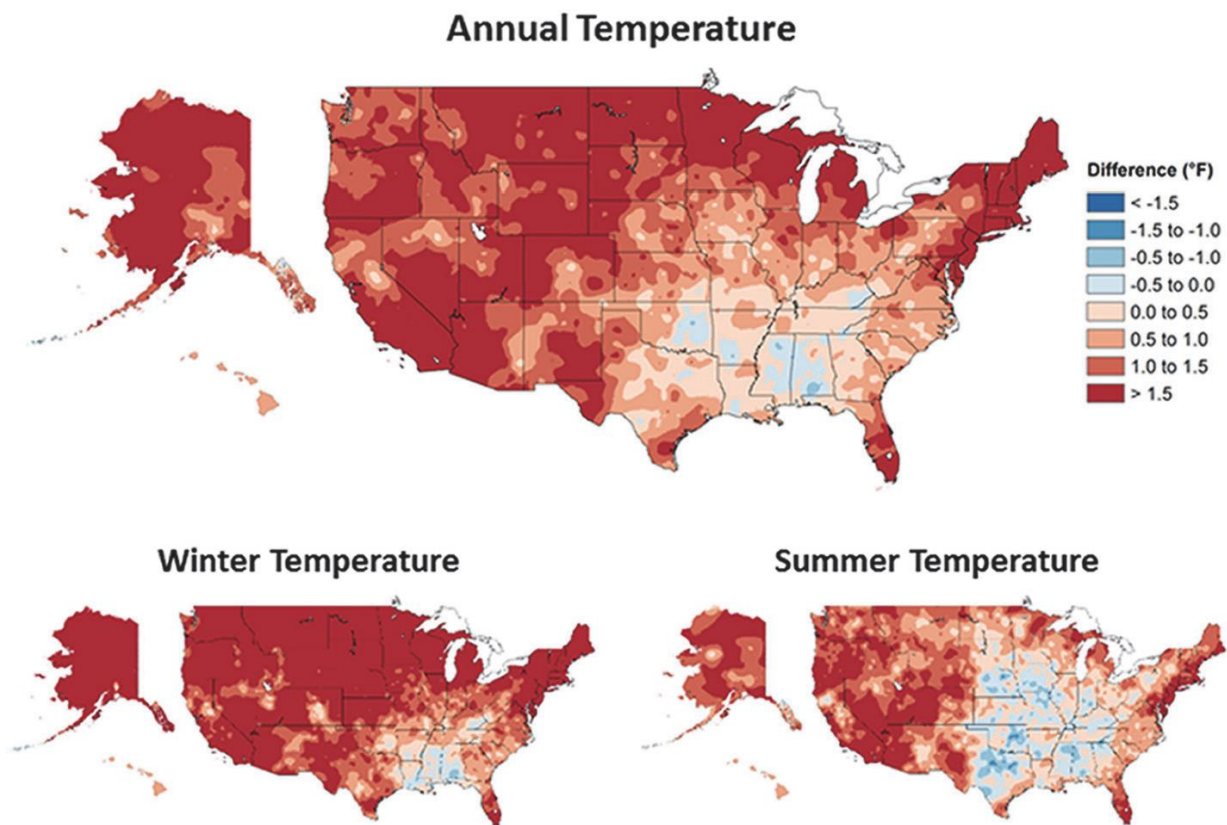
**Figure P-P-1. Rock Springs Wind Rose**



Future predicted climate maps include the following:

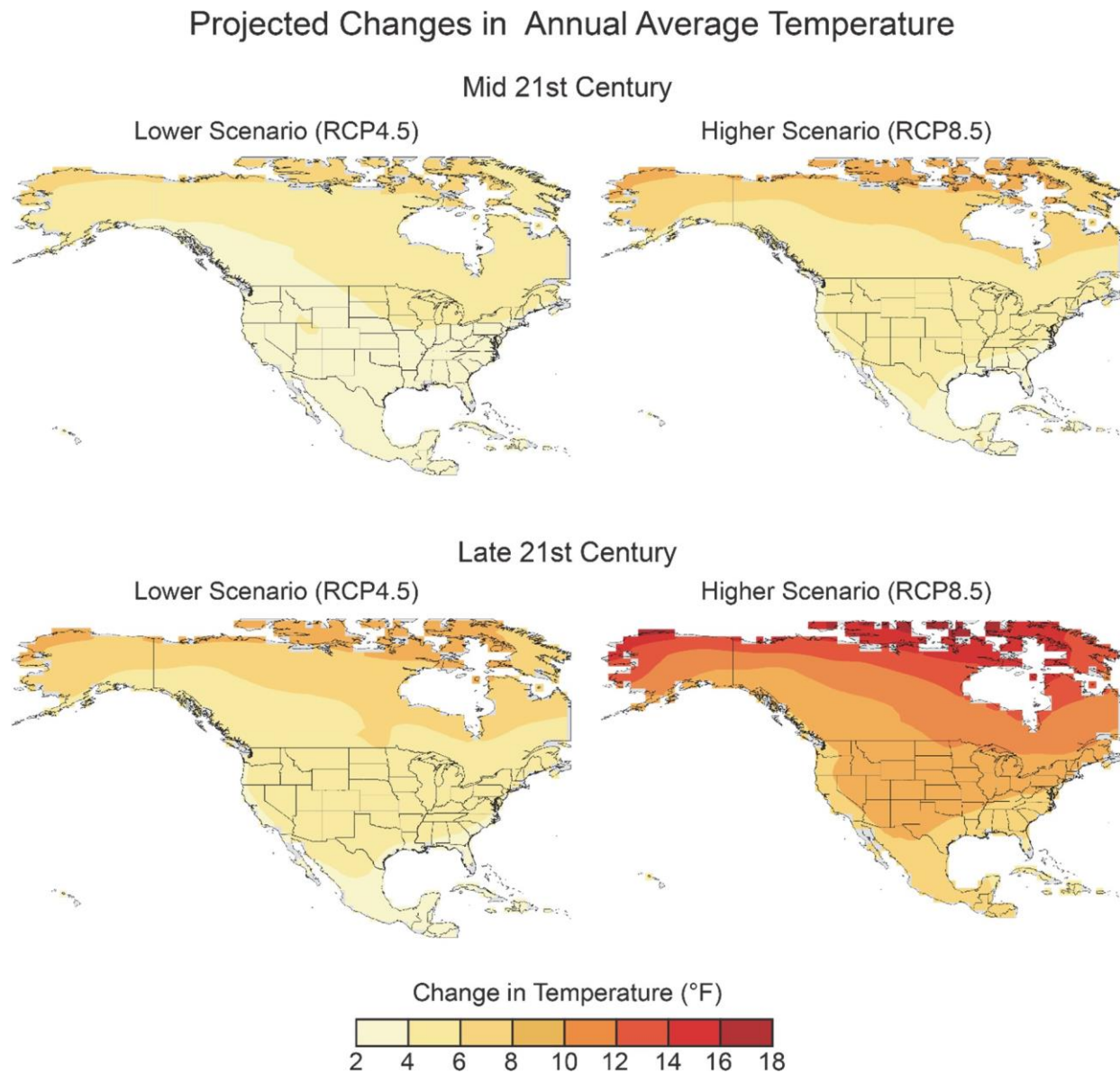
- Figure P-P-2. Observed Changes in Annual, Winter and Summer Temperatures (degrees Fahrenheit)
- Figure P-P-3. Projected Changes in Annual Average Temperature in North America (degrees Fahrenheit)
- Figure P-4. Projected Changes in the Number of Days Per Year with a Maximum Temperature Above 90°F and a Minimum Temperature Below 32°F in the Contiguous United States.

**Figure P-2. Observed Changes in Annual, Winter and Summer Temperatures (degrees Fahrenheit)**



“Changes are the difference between the average for present-day (1986–2016) and the average for the first half of the last century (1901–1960 for the contiguous United States, 1925–1960 for Alaska and Hawaii). Estimates are derived from the ClimDiv dataset (Figure source: NOAA/NCEI).” (USGCRP, 2018)

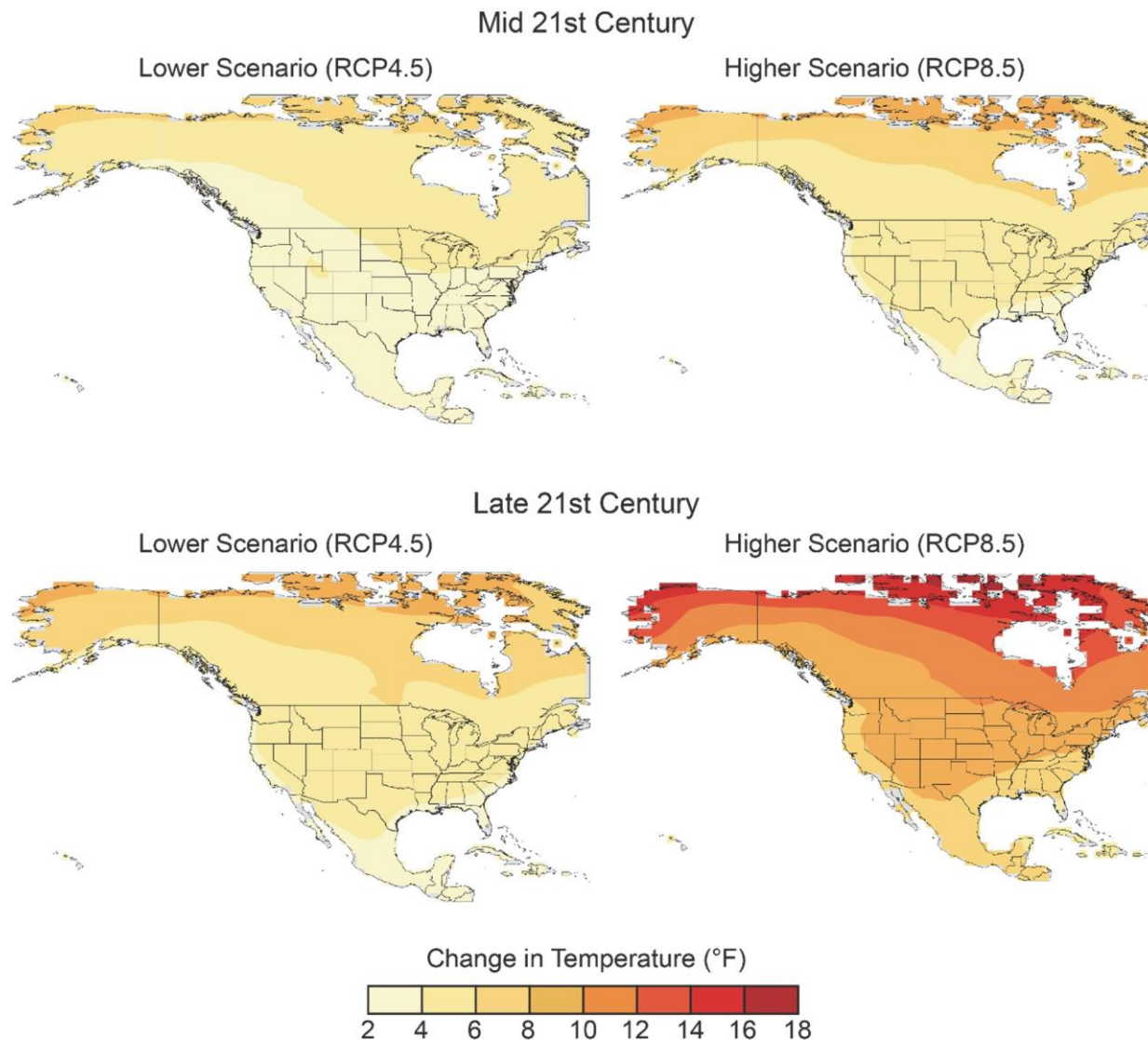
**Figure P-3. Projected Changes in Annual Average Temperature in North America (degrees Fahrenheit)**



“Changes are the difference between the average for mid-century (2036–2065; top) or late-century (2070–2099, bottom) and the average for near-present (1976–2005). Each map depicts the weighted multimodel mean. Increases are statistically significant in all areas (that is, more than 50% of the models show a statistically significant change, and more than 67% agree on the sign of the change). (Figure source: CICS-NC and NOAA NCEI).” (USGCRP, 2018)

**Figure P-4. Projected Changes in the Number of Days Per Year with a Maximum Temperature Above 90°F and a Minimum Temperature Below 32°F in the Contiguous United States**

Projected Changes in Annual Average Temperature



“Changes are the difference between the average for mid-century (2036–2065) and the average for near-present (1976–2005) under the higher scenario (RCP8.5). Maps in the top row depict the weighted multimodel mean whereas maps on the bottom row depict the mean of the three warmest models (that is, the models with the largest temperature increase). Maps are derived from 32 climate model projections that were statistically downscaled using the Localized Constructed Analogs technique. Changes are statistically significant in all areas (that is, more than 50% of the models show a statistically significant change, and more than 67% agree on the sign of the change). (Figure source: CICS-NC and NOAA NCEI).” (USGCRP, 2018)

## P.3 REGULATORY FRAMEWORK

For quantitative analysis, the air quality criteria in Section T.4 apply. Although the criteria listed below do not apply to the qualitative analysis presented in this final environmental impact statement (EIS), they are identified here for reference purposes. The basic framework for controlling air pollutants in the United States is mandated by the 1970 Clean Air Act (CAA) and its amendments, Environmental Protection Agency (EPA) regulations, including the 1999 Regional Haze Regulations, and state and local regulations. The CAA addresses criteria air pollutants, federal standards, and the Prevention of Significant Deterioration (PSD) program. The Regional Haze Regulations address visibility impairment. EPA regulations address ambient air quality standards for criteria pollutants, emission control technology, air quality monitoring, and State Implementation Plan (SIP) development (which may include air quality modeling and regulations), and air quality related value (AQRV) analyses related to regional haze.

### P.3.1 Ambient Air Quality Constituents

Air pollutants addressed in this study include criteria pollutants, hazardous air pollutants (HAP), which could cause visibility impairment (regional haze) or atmospheric deposition impacts, and greenhouse gases.

### P.3.2 Criteria Pollutants

Criteria pollutants are those for which national standards of concentration have been established. Ambient air concentrations of these constituents greater than the standards represent a risk to human health. Criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), and lead (Pb).

- **Carbon Monoxide.** CO is an odorless, colorless gas formed during any combustion process, such as operation of engines, fireplaces, and furnaces. High concentrations of CO affect the oxygen-carrying capacity of the blood and can lead to unconsciousness and asphyxiation. Wildfires are a natural source of CO.
- **Nitrogen Dioxide.** NO<sub>2</sub> is a red-brown gas formed during operation of internal combustion engines. Engines emit a mixture of nitrogen gases, collectively called nitrogen oxides (NO<sub>x</sub>). NO<sub>x</sub> can contribute to brown cloud conditions and can convert to ammonium nitrate particles and nitric acid, which can cause visibility impairment and acid rain. Bacterial action in soil can be a natural source of nitrogen compounds.
- **Sulfur Dioxide.** SO<sub>2</sub> forms during combustion from trace levels of sulfur in coal or diesel fuel. It can convert to ammonium sulfate ((NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>) and sulfuric acid (H<sub>2</sub>SO<sub>4</sub>), which can cause visibility impairment and acid rain. Volcanoes are natural sources of SO<sub>2</sub>. Anthropogenic sources include refineries and power plants.
- **Ozone.** O<sub>3</sub> is a faint blue gas that is generally not emitted directly into the atmosphere but is formed from the reaction of NO<sub>x</sub> and volatile reactive organic compound (VOC) emissions in the presence of sunlight. Internal combustion engines are the main source of NO<sub>x</sub>. Volatile organic compounds, like terpenes, are very reactive. Sources of VOCs include, but are not limited to, paint, varnish, and some types of vegetation. The faint acrid smell common after thunderstorms is caused by ozone formation by lightning. O<sub>3</sub> is a strong oxidizing chemical that can burn lungs and eyes, and damage plants.

- **Particulate Matter.** Particulate matter (e.g., soil particles, hair, pollen) is essentially small particles suspended in the air that settle to the ground slowly and may be resuspended if disturbed. Separate allowable concentration levels for particulate matter are based on the relative size of the particle:
  - PM<sub>10</sub> particles with diameters smaller than 10 micrometers are small enough to be inhaled and can cause adverse health effects.
  - PM<sub>2.5</sub> particles with diameters smaller than 2.5 micrometers are so small that they can be drawn deeply into the lungs and cause serious health problems. Particles in this size range are also the main cause of visibility impairment.
- **Lead.** Before the wide use of unleaded fuel for automobiles, lead particles were emitted from tailpipes. Lead is not considered in this EIS because no proposed projects are expected to emit lead. The lead standard is not addressed in this Technical Support Document because proposed projects will have no lead emission sources.

## Hazardous Air Pollutants

There are a wide variety of HAPs, including N-hexane, ethylbenzene, toluene, xylene, formaldehyde, and benzene. Although HAPs do not have ambient air quality standards associated with them, the EPA has issued reference concentrations (RfC) to evaluate the inhalation risk for cancerous and noncancerous health effects.

Although this EIS is a National Environmental Policy Act (NEPA) document and not a regulatory document, there are regulatory issues that should be taken into account in preparing this EIS and ensuing project-specific EISs. Actual regulation of HAPs is achieved through compliance with applicable maximum achievable control technology (MACT) standards and not through ambient air quality standards. Regulatory agencies implement control through section 112 programs, specifically section 112(g) case-by-case MACT determinations according to 40 Code of Federal Regulations (CFR) part 63, subpart B and section 112(d) MACT emission standards.

Any source that emits or has the potential to emit 10 tons per year or more of any HAP or 25 tons per year or more of any combination of HAPs is considered a major source and would require a Title V, part 70, operating permit review and permit. This may include either compliance with an applicable MACT emission standard or a case-by-case 112(g) MACT determination if the source is new or is the result of major modifications and no applicable MACT emission standard has been promulgated. Specific regulations that would apply in the planning area in 2018 include 40 CFR part 63 subpart HH National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities; 40 CFR part 63 subpart HHH, National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities; and 40 CFR Part 63 Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. This last regulation affects source categories using reciprocating engines for gas compression.

## Atmospheric Deposition Constituents

Sulfur and nitrogen compounds that can be deposited on terrestrial and aquatic ecosystems include nitric acid (HNO<sub>3</sub>), nitrate (NO<sub>3</sub><sup>-</sup>), ammonium (NH<sub>4</sub><sup>+</sup>), and sulfate (SO<sub>4</sub><sup>-</sup>). HNO<sub>3</sub> and NO<sub>3</sub><sup>-</sup> are not emitted directly into the air but form in the atmosphere from industrial and automotive emissions NO<sub>x</sub>. SO<sub>4</sub><sup>-</sup> is formed in the atmosphere from industrial emission of SO<sub>2</sub>. Deposition of HNO<sub>3</sub>, NO<sub>3</sub><sup>-</sup>, and SO<sub>4</sub><sup>-</sup> can adversely affect plant growth, soil chemistry, lichens, aquatic environments, and petroglyphs. NH<sub>4</sub><sup>+</sup> is primarily associated with feedlots and agricultural fertilization. Deposition of NH<sub>4</sub><sup>+</sup> can affect terrestrial and aquatic vegetation. While deposition may be beneficial as a fertilizer, it can adversely affect the timing of plant growth and dormancy.



## Greenhouse Gas Constituents

Greenhouse gases (GHG) are pollutants that are effective in preventing heat from escaping the earth's atmosphere and have been attributed to altering components of the earth's climate. These include carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O). Other identified GHGs, including hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride were not included in the analysis because proposed activities are not sources of these pollutants and emissions are expected to be insignificant or zero. Major sources of GHG are from stationary and mobile fossil fuel combustion sources (i.e., transportation, consumption of coal and natural gas).

## P.4 THRESHOLDS OF SIGNIFICANCE

### P.4.1 Criteria Pollutants

The National Ambient Air Quality Standards (NAAQS) are health-based standards for the maximum concentration of air pollutants at all locations to which the public has access. The NAAQS are legally enforceable standards. Concentrations above the NAAQS represent a risk to human health. The EPA has developed standards for each pollutant for a specific averaging time. Short averaging times (1, 8, and 24 hours) address short-term exposure, while the annual standards address long-term exposure. Wyoming has also established its own State standards, the Wyoming Ambient Air Quality Standards (WAAQS).

Chapter 3 of the resource management plan (RMP) and EIS presents the National Primary Air Quality Standards (NAAQS) and the Wyoming Primary Air Quality Standards (WAAQS). Analyses of proposed alternatives for project-specific EISs compare cumulative concentrations of air pollutants to the NAAQS and WAAQS. The Bureau of Land Management (BLM) requires that all authorized activities comply with applicable local, state, tribal, and federal air quality laws, regulations, and standards. Analyses of proposed alternatives for project-specific EISs compare cumulative concentrations of air pollutants to the NAAQS and WAAQS. The BLM requires that all authorized activities comply with applicable local, state, tribal, and federal air quality laws, regulations, and standards.

### P.4.2 Prevention of Significant Deterioration

The goal of the Prevention of Significant Deterioration (PSD) program is to ensure that air quality in areas with clean air does not significantly deteriorate while maintaining a margin for future industrial growth. Under the PSD program, each area in the United States is classified by the air quality in that region according to the following system:

- PSD Class I Areas: Congressional mandated PSD Class I Areas with pristine air quality, such as wilderness areas, national parks, and some Native American reservations, are accorded the strictest protection. Only very small incremental increases in concentration are allowed in order to maintain the air quality in these areas.
- PSD Class II Areas: Essentially all areas that are not designated Class I are designated Class II. Moderate incremental increases in concentration are allowed, although the concentrations are not allowed to reach the concentrations set by Wyoming and federal standards (i.e., WAAQS and NAAQS).
- PSD Class III Areas: No areas have yet been designated Class III. Concentrations would be allowed to increase up to the WAAQS and NAAQS.

The incremental increases allowed for specific pollutants in Class I and Class II areas can be found in the Wyoming Air Quality Standards and Regulations (Wyoming Department of Environmental Quality [WDEQ] 2016). Comparisons of potential PM<sub>10</sub>, NO<sub>2</sub>, and SO<sub>2</sub> concentrations in NEPA air quality analyses with PSD concentrations are intended only to evaluate a threshold of concern and do not represent a regulatory PSD Increment Consumption analysis. Regulatory PSD Increment Consumption analyses are solely the responsibility of the State of Wyoming, which has been granted primacy (with EPA oversight).

In project-specific EISs, the BLM does not perform a regulatory PSD analysis. The PSD increments are used only as a reference to give the public a better understanding of the level of potential impact.

## **Hazardous Air Pollutants**

Section 112 of the CAA lists more than 180 chemicals as HAPs. In addition, Sections 112 (d) and 112(g) require regulatory agencies to establish MACT standards for sources that emit HAPs. Any source that emits or has the potential to emit 10 tons per year or more of any HAP or 25 tons per year or more of any combination of HAPs is considered a major source and will require a Title V, Part 70, operating permit review and permit. In addition to MACT standards, EPA has listed (on its Air Toxics Database) Reference Exposure Levels (REL) for many of the HAPs.

### **P.4.3 Regional Haze Regulations**

Visibility impairment in the form of regional haze obscures the clarity, color, texture, and form of what one sees. Haze-causing pollutants (mostly fine particles) are directly emitted into the atmosphere or are formed when gases emitted into the air form particles as they are carried downwind. Emissions from human-caused and natural sources can be carried great distances, contributing to regional haze. The Wyoming Department of Environmental Quality–Air Quality Division (WDEP-AQD) submitted its Regional Haze State Implementation Plan (SIP), in accordance with 40 CFR Part 51.308 and Part 57.309, in January 2011 and approved by EPA March 2014.

Visual range, one of several ways to express visibility, is the greatest distance at which a person can distinguish a dark landscape feature from a light background like the sky. Without human-caused visibility impairment, natural visual range is estimated to average about 110–115 miles in the western United States and 60–80 miles in the eastern United States (Malm 1999). Visibility can also be expressed in terms of deciview (dv), a measure for describing perceived changes in visibility. One dv is defined as a change in visibility that is just perceptible to an average person.

The Regional Haze Regulations were developed by the EPA in response to the CAA Amendments of 1977 and 1990. They are intended to maintain visibility on the least impaired days and improve visibility on the most impaired days in mandatory Federal Class I areas across the United States, so that visibility in these areas is returned to natural conditions by 2064. These regulations require states to submit a regional haze SIP and progress reports to demonstrate reasonable progress toward the 2064 goal.

### **P.4.4 Applicability to the Rock Springs Planning Area**

Air pollution impacts are limited by local, state, tribal, and federal air quality regulations, standards, and implementation plans established under the CAA and administered by the WDEP-AQD with oversight from the EPA. Air quality regulations require proposed new, or modified existing, air pollutant emission stationary sources (including oil and gas compression facilities) to undergo a permitting review before their construction can begin. Therefore, the WDEP-AQD has the primary authority and responsibility to review permit applications and to require emission permits, fees, and control devices, before construction and/or operation.

Fugitive dust and exhaust from construction activities (road and well pad construction; oil or gas well drilling and completion), along with air pollutants emitted during operation (e.g., well operations, booster [field] and pipeline [sales] compressor engines), are potential causes of air quality impacts. These issues are more likely to generate public concern where natural gas development activities occur near residential areas or near PSD Class I and sensitive Class II areas. As described in Chapter 3, there are seven Class I areas in Wyoming, however there are no Class I areas located within the planning area. The planning area does intersect the 100-kilometer buffer with two Class I areas, see Chapter 3 for detailed information.

The U.S. Forest Service, National Park Service, and the U.S. Fish and Wildlife Service have also expressed concerns regarding potential atmospheric deposition (i.e., acid rain) and visibility impacts within downwind PSD Class I and sensitive Class II areas under their administration throughout Wyoming.

As explained in Chapter 3, the NAAQS and WAAQS are health-based standards for the maximum acceptable concentrations of air pollutants at locations to which the public has access. The analysis of the proposed alternatives must demonstrate continued compliance with all applicable local, state, tribal, and federal air quality standards. Existing air quality throughout the planning area is in compliance with most ambient air quality standards, as demonstrated by the relatively low concentration levels presented in the Analysis of the Management Situation. Currently, portions of Sweetwater County are still in nonattainment for the NAAQS and the WAAQS standards for 2008 Ozone. The U.S. Congress (through the CAA section 116) authorized local, state, and tribal air quality regulatory agencies to establish air pollution control requirements more (but not less) stringent than federal requirements. Also, under both the Federal Land Policy and Management Act (FLPMA) and the CAA, the BLM cannot authorize any activity that would not conform to all applicable local, state, tribal, and federal air quality laws, regulations, standards, and implementation plans.

Given the planning area's current air quality standards attainment status, future development projects that have the potential to emit more than 250 tons per year of any criteria pollutant (or certain listed sources that have the potential to emit more than 100 tons per year) would be required to undergo a site-specific regulatory PSD Increment Consumption analysis under the federal New Source Review permitting regulations. Development projects that require PSD permits may also be required by the applicable air quality regulatory agencies to incorporate additional emission control measures (including a best available control technology analysis and determination) to ensure protection of air quality resources, and to demonstrate that the combined impacts of all PSD sources will not exceed the allowable incremental air quality impacts for NO<sub>2</sub>, PM<sub>10</sub>, and SO<sub>2</sub>. Minor sources with emissions below the cutoff rates mentioned above do not require PSD permits; nevertheless, their emissions contribute to increment consumption.

A regulatory PSD Increment Consumption analysis may be conducted as part of a New Source Review, or independently. The determination of PSD increment consumption is a legal responsibility of the applicable air quality regulatory agencies, with EPA oversight. In addition, an analysis of cumulative impacts resulting from all existing sources and the permit applicant's sources is also required during New Source Review to demonstrate that applicable ambient air quality standards will be met during the operational lifetime of the permit applicant's operations.

Sources subject to the PSD permit review procedure are also required to demonstrate potential impacts on AQRV. These include visibility impacts, degradation of mountain lakes from atmospheric deposition (i.e., acid rain), and effects on sensitive flora and fauna in PSD Class I and Class II areas. The CAA also provides specific visibility protection procedures for the mandatory federal PSD Class I areas designated by the U.S. Congress on August 7, 1977, which included wilderness areas greater than 5,000 acres in size, as well as national parks and national memorial parks greater than 6,000 acres in size as of that date.

## P.5 AIR QUALITY IMPACT ASSESSMENT

As described in Chapter 4, Environmental Consequences (Air Quality), the BLM used a qualitative emission comparison approach this assessment. A qualitative method was selected because of a lack of specific project information on location, types, and magnitude of potential projects. Emissions calculations (see Section T.6 Emission Calculations) were based on the best available engineering data and assumptions, emission inventory procedures, and professional and scientific judgment. However, when specific data or procedures were not available, assumptions were applied (see emission assumptions, page T-12). For any future projects, significance criteria for potential air quality impacts will include local, state, tribal, and federally enforced legal requirements to ensure that air pollutant concentrations remain within specific allowable levels.

It is important to note that before actual development could occur, the applicable air quality regulatory agencies (including the state, tribe, or the EPA) would need to review specific air pollutant emissions preconstruction permit applications that examine potential project-specific air quality impacts. As part of these permit reviews (depending on source size), the air quality regulatory agencies could require additional quantitative air quality impact analyses or mitigation measures. Thus, before development occurred, additional site-specific air quality analyses may need to be performed to ensure protection of air quality. Federal land managers may require a demonstration that potential impacts from proposed projects would not adversely affect AQRV (including visibility) in sensitive Class I and Class II areas.

## P.6 EMISSION CALCULATIONS

For this analysis, emissions of PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>x</sub>, SO<sub>2</sub>, CO, VOC, HAPs, and GHG were estimated for a 20-year period starting in 2012, beginning with 2013 as the short year (year 1), 2021 as the mid-year (year 10), and 2031 as the long year (year 20). Emissions were estimated for the four alternatives: Alternative A (Current Management), Alternative B (Emphasizes Conservation), Alternative C (Emphasizes Resource Use), and Alternative D (Emphasizes Less Conservation than Alternative B and Less Use than Alternative C). The BLM's Excel spreadsheet-based emissions calculators were adapted for the analysis to estimate emissions for the planning area. Trona mining emissions were calculated separately using emissions factors and methodology from a Wyoming trona mining permit application (see Section T.6.3 for additional information for trona mining calculations). Emission factors used in the BLM calculators to estimate proposed emissions were obtained from: (1) the EPA NONROAD2008a Emissions Model, (2) EPA's AP-42 Guidance, and (3) EPA MOVES 2010a for mobile emissions factor model for non-road motor vehicles. Information regarding equipment types, numbers, activity, etc., for the various emission categories/activities was provided by specialists in the BLM Rock Springs Field Office.

When reviewing the resulting emissions inventory shown in Section T.6.4, it is important to understand that assumptions were made regarding development. For example, there is uncertainty regarding ultimate development of energy resources (e.g., number of wells, equipment used, specific locations of wells, etc.). In general, the assumptions that were made would tend to result in a conservatively high estimate of emissions. For instance, given the number of sources included in this analysis, the likelihood that all emission sources would actually operate at their reasonable, foreseeable maximum emission rates over an entire year (or even 24 hours) is small. A summary of total emissions for each pollutant species from all BLM activities is presented in Chapter 4, in the Air Quality Section. Detailed emission totals for each alternative/planning year are presented in Table P-3 through Table P-15.

### P.6.1 Emission Development Assumptions

For the qualitative emission comparison approach, the following assumptions were used:

- All emission sources are assumed to operate at their reasonably foreseeable maximum emission rates (as identified in the other resource sections of this document) simultaneously throughout the area. Given the number of sources included in this analysis, the co-probability of such a scenario actually occurring over an entire year (or even 24 hours) is small.
- In developing the emissions inventory, there is uncertainty regarding ultimate development (i.e., number of wells, equipment to be used, specific locations, etc.). Only 75% of the proposed oil and gas wells were assumed to be fully operational and remain operating, with normal well closures throughout the area at a rate of 12 wells per year. For coalbed natural gas (CBNG) wells, it was assumed that 80% of the wells drilled annually are fully operational and remain operating, with normal well closures throughout the area at a rate of one well per year. The BLM field office provided the well numbers used in this analysis.
- Mitigation measures are included in the emissions inventory that may not be achievable in all circumstances. However, actual mitigation decided upon by the developers and local and state authorities may be greater or lesser than those assumed in the analysis. For example, maintaining a construction road speed limit of 15 miles per hour (mph) may be reasonable in a construction zone but difficult to enforce elsewhere. Full (100%) mitigation of fugitive dust from disturbed lands may not be achievable. Further, 50% reduction in fugitive emissions is assumed based on construction road wetting on the unimproved access road to the pad and at the pad, but this level of effectiveness is characterized as the maximum possible. Wetting of haul roads was assumed for maintenance traffic.
- Induced or secondary growth related to increases in vehicle miles traveled (VMT) is not included in the emissions inventory. Only activities directly related to BLM actions are considered. (An example of ‘secondary’ development is where an increase of workers causes an increase of more people to support them, such as shopping centers. Growth of air emissions would occur to secondary activities, such as workers traveling to the store or to recreational activities.)

The major assumptions used in developing the emissions calculations are:

- EPA-recommended emission factors (i.e., *AP-42*) are appropriate for all activities.
- Activity factors (or the quantification of activity for each resource program as provided by the Rock Springs Field Office) are appropriate for the short year (year 1) and all future time frames. Activity factors, such as production wells, and well abandonment, are taken into account for each year. The rates of well closures and successful wells (i.e. producing wells) remains constant throughout each year (see the second bullet for details).
- For the qualitative analysis, only emissions from Rock Springs Field Office BLM-administered activities are included.
- For the cumulative impacts analysis, emissions calculated for oil and gas taking place within the Rock Springs Field Office (including for federal and non-federal actions), statewide, and county emissions are included. Statewide and county emissions were obtained from the most recent National Emissions Inventory from 2014.

Emissions were calculated for the following activities: oil development and production, natural gas development and production, CBNG development and production, coal mining, trona mining, sand and gravel mining, BLM travel, lands and realty actions, trails and roads, livestock grazing, vegetation management, and fire management.

A qualitative emission comparison approach was selected for this RMP air quality analysis. This approach was used because: (1) the uncertainty of the data and future demand for fluid and solid minerals development impacting the accuracy of the estimated emissions and (2) as projects are defined, quantitative analysis will be required. There are limitations associated with this approach. However, given the uncertainties with the number, nature, and specific location of future sources and activities, the emission comparison approach is defensible and provides a sound basis to compare alternatives.

It is important to note that before actual development could occur, the applicable air quality regulatory agencies (including the state, Tribal, or EPA) would review specific air pollutant emissions preconstruction permit applications that examine potential project-specific air quality impacts. As part of these permit reviews (depending on source size), the air quality regulatory agencies could require additional air quality impact analyses or mitigation measures. Thus, before development occurs, additional site-specific air quality analyses would be performed to ensure protection of air quality. Per the FLPMA, the BLM would need to demonstrate that potential impacts from proposed projects will not adversely affect AQRVs (including visibility) in PSD Class I and sensitive Class II areas.

## **P.6.2 Emissions Estimation Criteria**

Emissions from BLM-associated activities were calculated based on data provided by the Rock Springs Field Office and best available information, AP-42, and the emission analysis results from previous BLM studies. The BLM used the BLM calculators to estimate emissions from the proposed scenarios. Because oil and gas field activities comprise many phases (i.e., exploration, development, production, and closure), the components that need to be included in emission calculations are complex. The text below provides details on the emissions estimated from the various sources analyzed as part of this RMP.

Estimated emissions from oil, gas, and CBNG wells include the following:

- Fugitive dust, combustive, and GHG emissions from well pad construction activities
- Fugitive dust, combustive, and GHG emissions from road traffic
- Fugitive dust, combustive, and GHG emissions from construction and drilling support vehicles
- Combustive emissions from natural gas-fired compressors (CBNG well only)
- Fugitive dust, combustive, and GHG emissions from separators, dehydrators, and water-tank heater operations
- Fugitive dust, combustive, and GHG emissions from compressor station visits
- Fugitive dust, combustive, and GHG emissions from well workover operations
- Fugitive dust, combustive, and GHG emissions from well and pipeline visits for inspection and repair
- HAPs and VOC emissions from tank condensate, venting (for natural gas wells only) and truck loadout (for natural gas wells only)
- Fugitive dust, combustive, and GHG emissions from road-maintenance activities
- Fugitive dust, combustive, and GHG emissions from road and well reclamation activities
- VOC and GHG from wellhead fugitives and venting.

Estimated emissions from coal mining include the following:

- Fugitive dust, combustive, and GHG emissions from extraction and processing activities, road traffic, and reclamation activities.

Estimated emissions from sand and gravel mining include the following:

- Fugitive dust, combustive, and GHG emissions from extraction and processing activities, road traffic, and reclamation activities.

Estimated emissions from BLM trails and roads include the following:

- Fugitive dust, combustive, and GHG emissions from road traffic
- Fugitive dust, combustive, and GHG emissions from maintenance activities (trails and travel only).

Estimated emissions from fire management include the following:

- Fugitive dust and smoke from fires
- Fugitive dust, combustive, and GHG emissions from road traffic and heavy equipment operations.

Estimated emissions from vegetation management and rights-of-way (ROW) include the following:

- Fugitive dust, combustive, and GHG emissions from road traffic and heavy equipment operations.

Estimated emissions from livestock grazing include the following:

- Fugitive dust, combustive, and GHG emissions from road traffic and heavy equipment operations
- Methane emissions from enteric fermentation and manure management operations.

Summaries of emission inventories for each of the BLM activities for the short-year (year 1), mid-year (year 10), and long-year (year 20) scenarios are provided in Section T.6.4 for all of the alternatives. These emissions were calculated from data provided by the Rock Springs Field Office and used the best available information, AP-42, and the emission studies from other BLM documents.

The assumed numbers of oil and gas wells are provided by the Rock Springs Field Office and are shown in Table P-2. This table accounts for new wells to be drilled in the planning area.

**Table P-2. Total Producing Wells for BLM and Non-BLM Activities Per Alternative\***

Activity	Scenario							
	Alternative A		Alternative B		Alternative C		Alternative D	
	Fed	Non-Fed	Fed	Non-Fed	Fed	Non-Fed	Fed	Non-Fed
<b>Short Year (Year 1)</b>								
Producing Oil Wells	171	76	158	76	172	76	171	76
Producing Natural Gas Wells	1,539	687	1,424	687	1,544	688	1,538	688
Producing CBNG Wells	33	27	30	27	34	27	33	27
<b>Mid-Year (Year 10)</b>								
Producing Oil Wells	316	108	188	108	321	108	314	108
Producing Natural Gas Wells	2,843	973	1,690	972	2,886	976	2,828	976
Producing CBNG Wells	68	34	42	33	75	36	72	36

Activity	Scenario							
	Alternative A		Alternative B		Alternative C		Alternative D	
	Fed	Non-Fed	Fed	Non-Fed	Fed	Non-Fed	Fed	Non-Fed
<b>Long Year (Year 20)</b>								
Producing Oil Wells	478	144	222	144	488	145	475	145
Producing Natural Gas Wells	4,304	1,294	1,997	1,293	4,390	1,302	4,273	1,302
Producing CBNG Wells	100	59	49	58	114	64	107	64

\*As per the RFD it is assumed that 75% of all new oil and gas wells drilled and 80% of all CBNG wells drilled become producing.

Estimated emissions from oil and gas development for all alternatives were calculated using a reasonably foreseeable development rate based on historical development rates for federal wells within the planning area over the last 20 years. Estimated emissions from oil and gas activities were based on a rate of 75% of all new oil and gas wells being producing wells. It was also assumed that a rate of 12 oil and gas wells would be abandoned annually.

Estimated emissions from CBNG development for all alternatives were calculated using a reasonably foreseeable development rate based on historical development rates for federal wells within the planning area over the last 20 years. Estimated emissions from CBNG activities were based on a rate of 80% of all new oil and gas wells being producing wells. It was also assumed that a rate of one CBNG well would be abandoned annually.

### P.6.3 Trona Mining Emissions Estimation

The BLM calculators do not account for trona mining; therefore, the BLM developed a separate calculator to estimate trona mining emissions. The BLM based the trona mine emissions calculator on a permit application analysis prepared by the WDEP-AQD for the Ciner Wyoming, LLC, Big Island Mine and Refinery. The BLM used this analysis to develop emission factors based on tons of trona produced per year. The Ciner facility emissions estimate included soda ash dryers, coolers, and calciner; vents for the mines and processing equipment; heavy machinery used around the facility; and both gasoline and diesel industrial engines. The BLM included these sources in its trona mining emissions calculator.

The BLM also accounted for employee commute emissions and the transfer of trona off-site via train to two locations outside of Wyoming. For consistency, the BLM used the same emission factors for employee commuting emissions and emissions from the transfer of trona by locomotive that were used for the BLM calculators. The BLM calculator emission factors were obtained from (1) the EPA NONROAD2008a Emissions Model, (2) EPA's AP-42 Guidance, and (3) EPA Emission Factors for Locomotives. The BLM used the Union Pacific Website to obtain information on fuel consumed (ton-miles/gallon) during trona shipping using the locomotives.

The 2012 Soil Mineral Occurrence and Development Potential Report for the Rock Springs Field Office (BLM 2012) was used to calculate the trona numbers. The numbers are as follows:

- The total annual tons of trona produced in the Rock Springs planning area is 2,641,105 tons/year.
  - The 2012 Mineral Potential Report states the total amount mined in year 2010 was 16,506,904 tons. The 16.5-million-ton estimate is for all production from the Green River Basin (KSLA). For estimating the emissions from activity on BLM managed lands, the checkerboard land



- ownership pattern is factored in. Therefore, the factor would be 3,653,566 mineral estate acres per 5,700,195 total acres or 64.1% (BLM, 2012). This factor is multiplied by 25% to account for the checkerboard land ownership, resulting in BLM trona emission equaling 16% (2,641,105 tons/year) of the total KSLA mined material.
- The total number of commuting employees in the Rock Springs planning area is 716.
    - The number of employees was calculated in the same manner as tons mined per year. The number of employee commuters is based on 33% (716) of the total workers in the KSLA (2,151 employees), as identified in the Mineral Potential Report for the Rock Springs Field Office.

#### **P.6.4 Summary of the Rock Springs Planning Area BLM Emissions for All Activities**

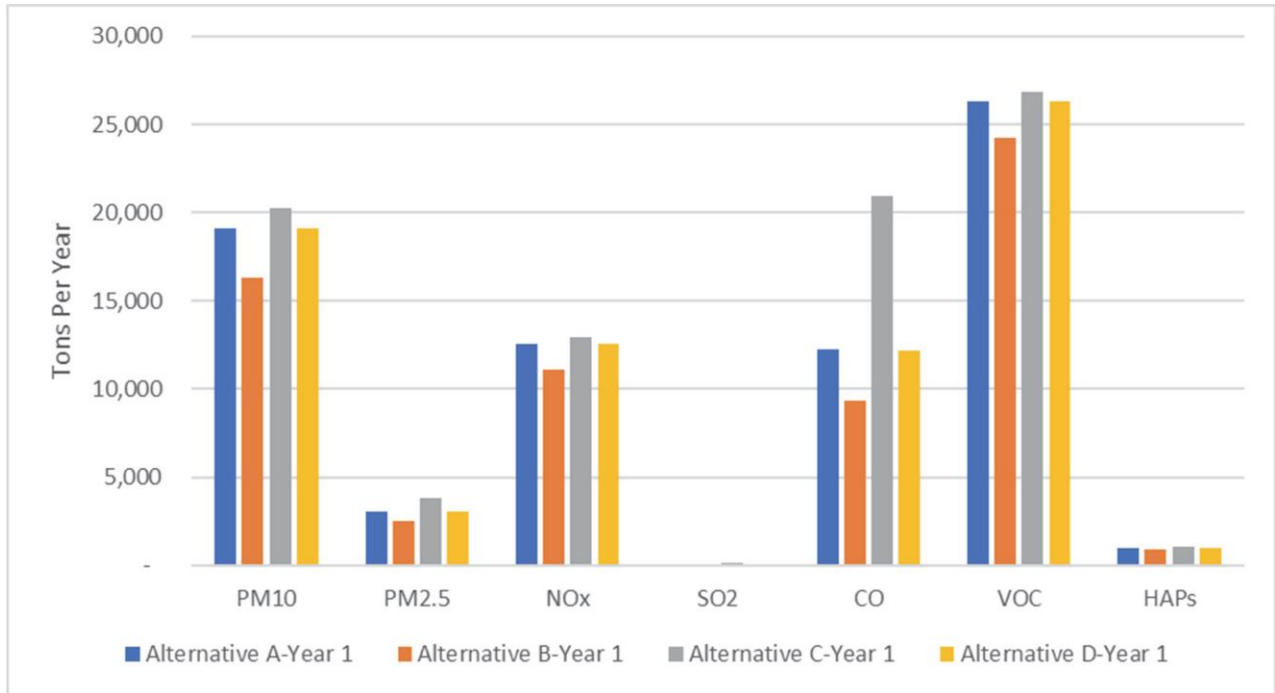
Table P-3 through Table P-14 summarizes the projected total annual emissions by alternative from the short-year (year 1), mid-year (year 10), and long-year (year 20) and Table P-15 summarizes the projected total annual emissions for trona mining for all alternatives.

Air quality impacts would primarily result from minerals development and production and oil and natural gas development activities; emissions associated with these actions would outweigh those produced from other proposed activities.

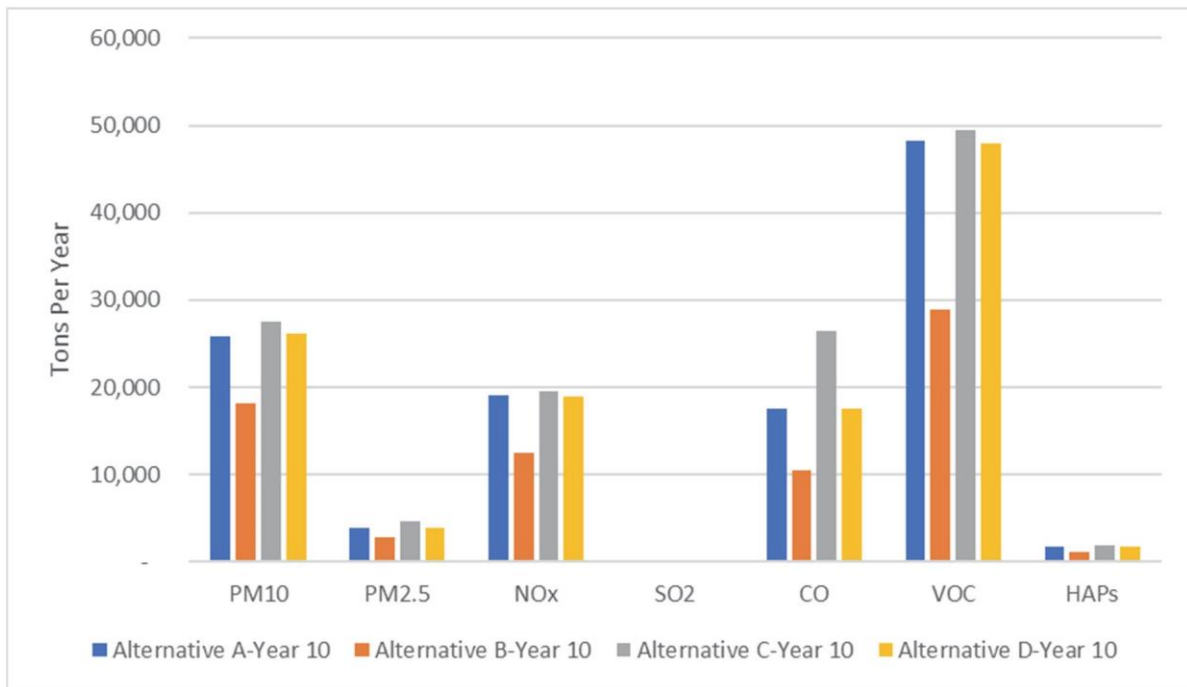
The alternatives were compared to each other and the results show that Alternative B would result in the lowest levels of emissions in the short year (year 1), mid-year (year 10), and long year (year 20) for all pollutants, while Alternative C would result in the highest levels of emissions for all years. In general, all emissions are likely to be greatest under Alternative C, followed by Alternative A, Alternative D, and Alternative B, respectively. However, since Alternative D has a higher RFD prediction for CBNG wells than Alternative A, the Mid- and Long-Year emissions exceed that of Alternative A. Specifically, for the Mid-Year, PM10, PM2.5, VOC, and CH4 Alternative D has the second highest emissions, while all other pollutants were second highest for Alternative A. For the Long-Year, PM10, PM2.5 Alternative D has the second highest emissions, while all other pollutants were second highest for Alternative A. This is due primarily to the higher RFD rate predicted for fluid and solid mineral activities for Alternatives A over D with exception of CBNG Wells, where Alternative D is higher.

For each alternative, Figure P-5, Figure P-6, and Figure P-7 present a visual summary of the regulated pollutant emissions for short-year (year 1), mid-year (year 10), and long-year (year 20), respectively. Figure P-8, Figure P-9, and Figure P-10 present a visual summary of the GHG pollutant emissions for short-year (year 1), mid-year (year 10), and long-year (year 20), respectively.

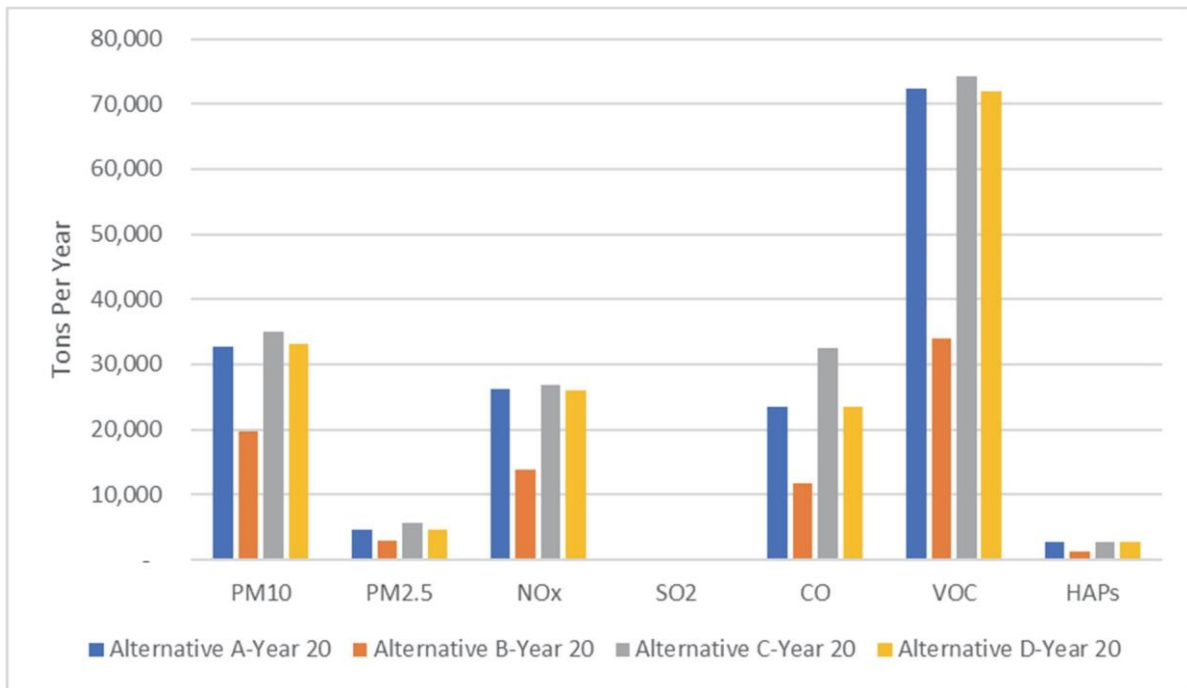
**Figure P-5. Emissions Estimates for Short Year from BLM Activities in the Rock Springs Planning Area - Criteria Pollutants**



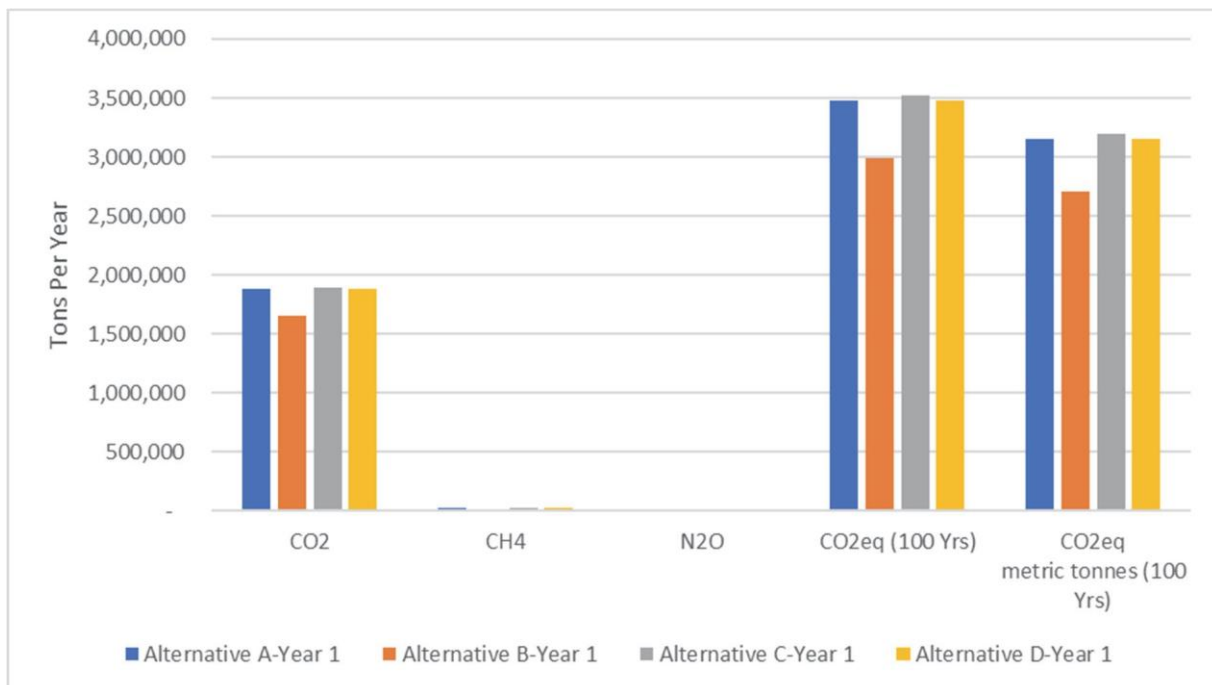
**Figure P-6. Emissions Estimates for Mid-Year from BLM Activities in the Rock Springs Planning Area - Criteria Pollutants**



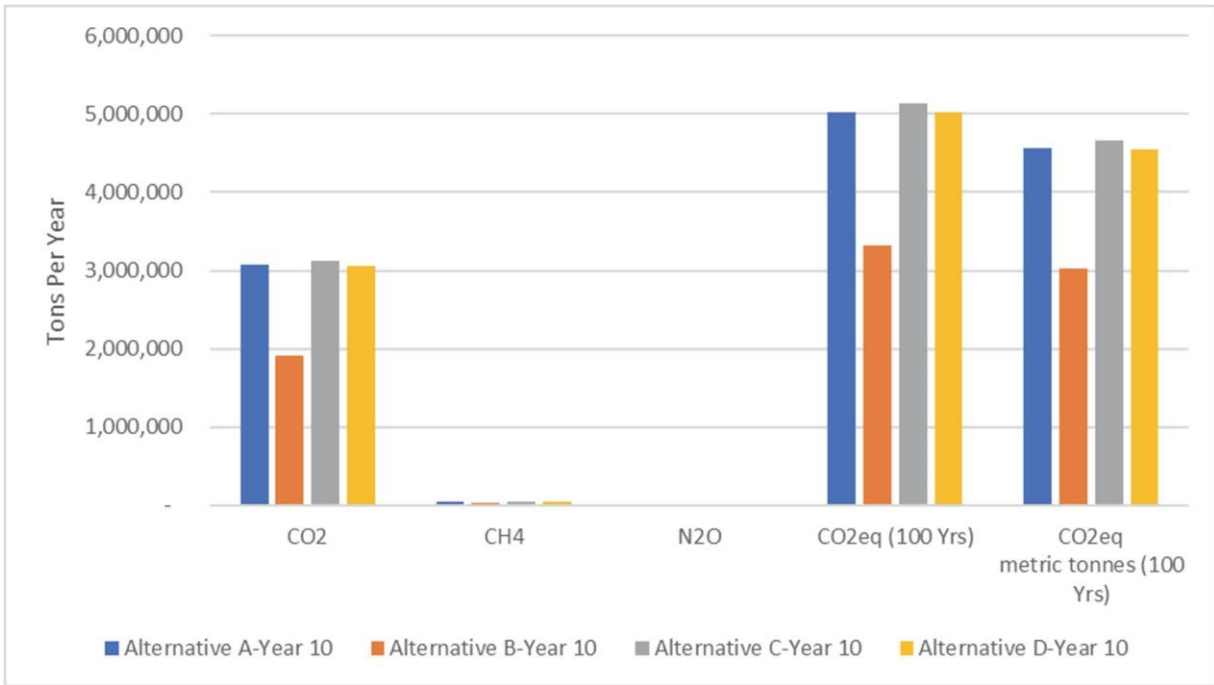
**Figure P-7. Emissions Estimates for Long Year from BLM Activities in the Rock Springs Planning Area - Criteria Pollutants**



**Figure P-8. Emissions Estimates for Short Year from BLM Activities in the Rock Springs Planning Area – GHG**



**Figure P-9. Emissions Estimates for Mid-Year from BLM Activities in the Rock Springs Planning Area – GHG**



**Figure P-10. Emissions Estimates for Long Year from BLM Activities in the Rock Springs Planning Area – GHG**

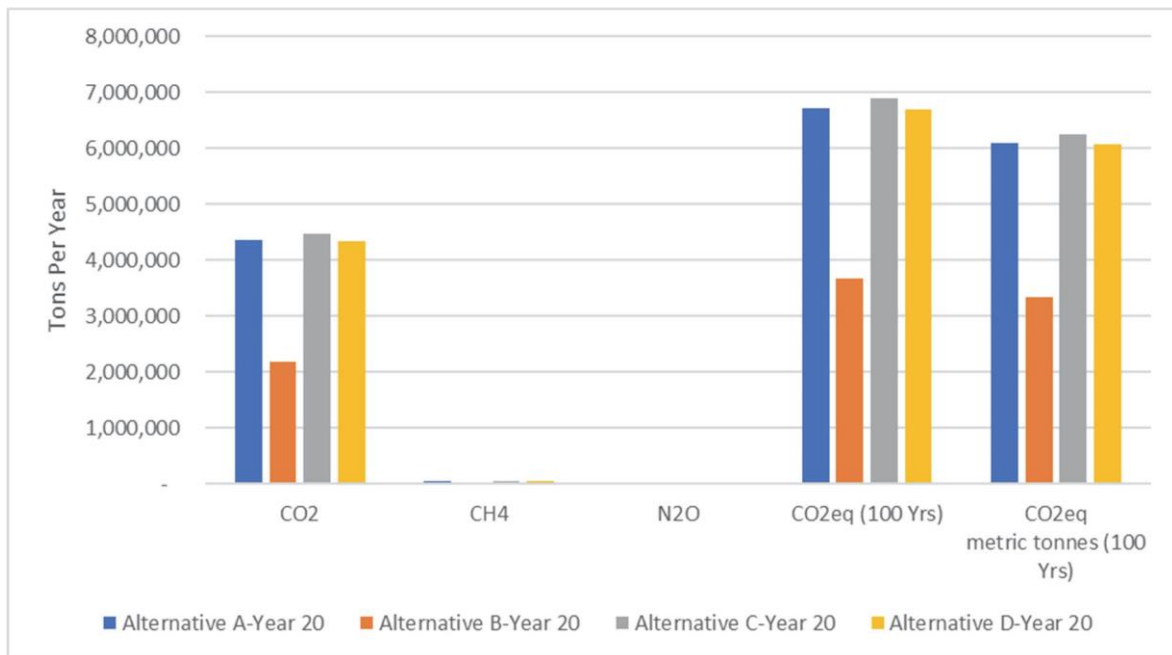


Table P-16 through Table P-28 summarize the inputs used to obtain annual emissions. Additional detail on specific inputs can be found in the BLM Excel calculation documents.

Table P-29 and Table P-30 summarize the data used to develop the GHG emissions and cumulative impacts.

**Table P-3. Alternative A—Short-Year Air Emissions Summary, Total Annual Emissions, All Project Resources (Tons)**

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Federal Oil Wells - Sub-total: Construction	122	15	65	<1	16	4	<1	8,025	<1	<1	8,052	7,305
Federal Oil Wells - Sub-total: Operations	182	36	4,969	1	2,595	417	35	225,832	1,003	2	254,545	230,920
Federal Oil Wells - Sub-total: Maintenance	223	31	111	<1	70	18	2	12,462	<1	<1	12,495	11,335
Federal Oil Wells - Sub-total: Reclamation	3	<1	1	<1	<1	<1	<1	88	<1	<1	89	80
<b>Federal Oil Wells - Total Emissions</b>	<b>530</b>	<b>82</b>	<b>5,146</b>	<b>2</b>	<b>2,682</b>	<b>439</b>	<b>38</b>	<b>246,407</b>	<b>1,003</b>	<b>3</b>	<b>275,181</b>	<b>249,640</b>
Non-Federal Oil Wells - Sub-total: Construction	26	3	14	<1	4	1	<1	1,745	<1	<1	1,765	1,601
Non-Federal Oil Wells - Sub-total: Operations	81	16	2,208	1	1,153	185	16	100,370	446	1	113,131	102,631
Non-Federal Oil Wells - Sub-total: Maintenance	99	14	49	<1	31	8	1	5,538	<1	<1	5,553	5,038
Non-Federal Oil Wells - Sub-total: Reclamation	1	<1	<1	<1	<1	<1	<1	39	<1	<1	39	36
<b>Non-Federal Oil Wells - Total Emissions</b>	<b>208</b>	<b>33</b>	<b>2,272</b>	<b>1</b>	<b>1,188</b>	<b>194</b>	<b>17</b>	<b>107,692</b>	<b>446</b>	<b>1</b>	<b>120,488</b>	<b>109,305</b>
Federal Natural Gas Wells - Sub-total: Construction	3,330	461	1,144	3	283	82	8	159,269	21	1	160,231	145,359
Federal Natural Gas Wells - Sub-total: Operations	4,233	531	2,141	6	3,106	24,422	812	1,073,981	12,516	16	1,428,730	1,296,123
Federal Natural Gas Wells - Sub-total: Maintenance	105	15	52	<1	33	9	1	5,841	<1	<1	5,857	5,313
Federal Natural Gas Wells - Sub-total: Reclamation	16	2	3	<1	2	1	<1	394	<1	<1	395	358
<b>Federal Natural Gas Wells - Total Emissions</b>	<b>7,683</b>	<b>1,009</b>	<b>3,340</b>	<b>8</b>	<b>3,424</b>	<b>24,513</b>	<b>821</b>	<b>1,239,485</b>	<b>12,537</b>	<b>18</b>	<b>1,595,213</b>	<b>1,447,053</b>
Non-Federal Natural Gas Wells - Sub-total: Construction	781	108	268	1	66	19	2	37,341	5	1	37,845	34,342

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Non-Federal Natural Gas Wells - Sub-total: Operations	1,889	237	955	2	1,386	10,902	363	479,377	5,587	7	637,735	578,543
Non-Federal Natural Gas Wells - Sub-total: Maintenance	47	7	23	<1	15	4	<1	2,608	<1	<1	2,615	2,373
Non-Federal Natural Gas Wells - Sub-total: Reclamation	7	1	2	<1	1	<1	<1	176	<1	<1	176	160
<b>Non-Federal Natural Gas Wells - Total Emissions</b>	<b>2,723</b>	<b>353</b>	<b>1,248</b>	<b>3</b>	<b>1,468</b>	<b>10,925</b>	<b>365</b>	<b>519,501</b>	<b>5,592</b>	<b>9</b>	<b>678,370</b>	<b>615,407</b>
Federal CBNG Wells - Sub-total: Construction	14	2	10	<1	4	1	<1	1,515	<1	<1	1,520	1,379
Federal CBNG Wells - Sub-total: Operations	2,360	244	189	<1	345	386	49	35,127	1,145	<1	67,240	60,999
Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Federal CBNG Wells - Sub-total: Reclamation	10	1	<1	<1	<1	<1	<1	13	<1	<1	13	12
<b>Federal CBNG Wells - Total Emissions</b>	<b>2,385</b>	<b>247</b>	<b>200</b>	<b>&lt;1</b>	<b>349</b>	<b>387</b>	<b>49</b>	<b>36,655</b>	<b>1,145</b>	<b>&lt;1</b>	<b>68,773</b>	<b>62,390</b>
Non-Federal CBNG Wells - Sub-total: Construction	9	1	7	<1	3	1	<1	1,010	<1	<1	1,013	919
Non-Federal CBNG Wells - Sub-total: Operations	1,931	200	155	<1	282	316	40	28,740	937	<1	55,015	49,909
Non-Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Non-Federal CBNG Wells - Sub-total: Reclamation	8	1	<1	<1	<1	<1	<1	10	<1	<1	10	9
<b>Non-Federal CBNG Wells - Total Emissions</b>	<b>1,949</b>	<b>202</b>	<b>162</b>	<b>&lt;1</b>	<b>285</b>	<b>316</b>	<b>40</b>	<b>29,761</b>	<b>937</b>	<b>&lt;1</b>	<b>56,039</b>	<b>50,837</b>
Federal Sand and Gravel - Extraction and Processing Sub-total:	251	26	2	<1	1	<1	<1	215	<1	<1	216	196

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Federal Sand and Gravel - Travel and Reclamation Sub-total:	7	<1	<1	<1	<1	<1	<1	32	<1	<1	32	29
<b>Federal Sand and Gravel - Total Emissions</b>	<b>258</b>	<b>26</b>	<b>2</b>	<b>&lt;1</b>	<b>1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>247</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>248</b>	<b>225</b>
Federal Coal Mining - Sub-total: Extraction and Processing	6,989	931	2,244	5	1,419	371	37	251,580	5	2	252,250	228,837
Federal Coal Mining - Sub-total: Travel and Reclamation	125	14	14	<1	9	2	<1	1,645	<1	<1	1,649	1,496
<b>Federal Coal Mining - Total Emissions</b>	<b>7,114</b>	<b>945</b>	<b>2,258</b>	<b>5</b>	<b>1,428</b>	<b>374</b>	<b>37</b>	<b>253,225</b>	<b>5</b>	<b>2</b>	<b>253,899</b>	<b>230,334</b>
<b>Federal Fire Management and Ecology - Total Emissions</b>	<b>274</b>	<b>194</b>	<b>85</b>	<b>17</b>	<b>2,174</b>	<b>114</b>	<b>11</b>	<b>9,172</b>	<b>115</b>	<b>17</b>	<b>16,845</b>	<b>15,281</b>
Federal Land Resources (ROW and Renewable Energy [RE]) - Sub-total: Heavy Equipment	59	10	43	<1	24	7	1	5,079	<1	<1	5,093	4,620
Federal Land Resources (ROW and RE) - Sub-total: Commuting Vehicles	4	<1	<1	<1	1	<1	<1	114	<1	<1	114	103
<b>Federal Land Resources (ROW and RE) - Total Emissions</b>	<b>62</b>	<b>11</b>	<b>43</b>	<b>&lt;1</b>	<b>25</b>	<b>7</b>	<b>1</b>	<b>5,193</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>5,207</b>	<b>4,724</b>
Federal Livestock Grazing - Sub-total: Heavy Equipment	26	3	2	<1	1	<1	<1	216	<1	<1	216	196
Federal Livestock Grazing - Sub-total: Commuting Vehicles	38	4	8	<1	2	<1	<1	1,482	11,216	<1	315,535	286,248
<b>Federal Livestock Grazing - Total Emissions</b>	<b>64</b>	<b>7</b>	<b>9</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>1,698</b>	<b>11,216</b>	<b>&lt;1</b>	<b>315,751</b>	<b>286,444</b>
<b>Federal Trails and Roads -Total Emissions</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>496</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>497</b>	<b>451</b>
Federal Vegetation Management - Sub-total: Heavy Equipment	7	1	<1	<1	<1	<1	<1	35	<1	<1	35	32
Federal Vegetation Management - Sub-total: Commuting Vehicles	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1



Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
<b>Federal Vegetation Management - Total Emissions</b>	7	1	<1	<1	<1	<1	<1	35	<1	<1	35	32
<b>Federal BLM General Purpose Travel - Total Emissions</b>	28	3	<1	<1	2	<1	<1	150	<1	<1	151	137

**Table P-4. Alternative B—Short-Year Air Emissions Summary, Total Annual Emissions, All Project Resources (Tons)**

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
Federal Oil Wells - Sub-total: Construction	33	4	17	<1	4	1	<1	2,093	<1	<1	2,101	1,906
Federal Oil Wells - Sub-total: Operations	168	33	4,591	1	2,398	385	33	208,664	927	2	235,194	213,364
Federal Oil Wells - Sub-total: Maintenance	206	29	103	<1	65	17	2	11,514	<1	<1	11,545	10,473
Federal Oil Wells - Sub-total: Reclamation	1	<1	<1	<1	<1	<1	<1	34	<1	<1	34	31
<b>Federal Oil Wells - Total Emissions</b>	<b>409</b>	<b>66</b>	<b>4,711</b>	<b>1</b>	<b>2,467</b>	<b>403</b>	<b>34</b>	<b>222,305</b>	<b>927</b>	<b>2</b>	<b>248,873</b>	<b>225,744</b>
Non-Federal Oil Wells - Sub-total: Construction	27	3	14	<1	4	1	<1	1,745	<1	<1	1,751	1,589
Non-Federal Oil Wells - Sub-total: Operations	81	16	2,208	1	1,153	185	16	100,370	446	1	113,131	102,631
Non-Federal Oil Wells - Sub-total: Maintenance	99	14	49	<1	31	8	1	5,539	<1	<1	5,553	5,038
Non-Federal Oil Wells - Sub-total: Reclamation	1	<1	<1	<1	<1	<1	<1	16	<1	<1	16	15
<b>Non-Federal Oil Wells - Total Emissions</b>	<b>208</b>	<b>33</b>	<b>2,272</b>	<b>1</b>	<b>1,188</b>	<b>194</b>	<b>17</b>	<b>107,669</b>	<b>446</b>	<b>1</b>	<b>120,452</b>	<b>109,272</b>
Federal Natural Gas Wells - Sub-total: Construction	1,546	219	301	1	74	22	2	41,913	5	<1	42,166	38,252
Federal Natural Gas Wells - Sub-total: Operations	3,915	491	1,980	5	2,874	22,597	752	993,599	11,581	15	1,321,839	1,199,153

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Federal Natural Gas Wells - Sub-total: Maintenance	97	14	48	<1	30	8	1	5,405	<1	<1	5,419	4,916
Federal Natural Gas Wells - Sub-total: Reclamation	6	1	1	<1	1	<1	<1	155	<1	<1	155	141
<b>Federal Natural Gas Wells - Total Emissions</b>	<b>5,564</b>	<b>725</b>	<b>2,331</b>	<b>6</b>	<b>2,979</b>	<b>22,627</b>	<b>755</b>	<b>1,041,071</b>	<b>11,587</b>	<b>15</b>	<b>1,369,580</b>	<b>1,242,463</b>
Non-Federal Natural Gas Wells - Sub-total: Construction	1,377	196	268	1	66	19	2	37,341	5	<1	37,577	34,089
Non-Federal Natural Gas Wells - Sub-total: Operations	1,889	237	955	2	1,386	10,902	363	479,377	5,587	7	637,735	578,543
Non-Federal Natural Gas Wells - Sub-total: Maintenance	47	7	23	<1	15	4	<1	2,608	<1	<1	2,615	2,372
Non-Federal Natural Gas Wells - Sub-total: Reclamation	3	<1	1	<1	<1	<1	<1	75	<1	<1	75	68
<b>Non-Federal Natural Gas Wells - Total Emissions</b>	<b>3,316</b>	<b>440</b>	<b>1,248</b>	<b>3</b>	<b>1,468</b>	<b>10,925</b>	<b>365</b>	<b>519,400</b>	<b>5,592</b>	<b>8</b>	<b>678,001</b>	<b>615,072</b>
Federal CBNG Wells - Sub-total: Construction	7	1	6	<1	3	1	<1	830	<1	<1	833	755
Federal CBNG Wells - Sub-total: Operations	2,146	222	172	<1	313	351	45	31,621	1,041	<1	60,813	55,169
Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Federal CBNG Wells - Sub-total: Reclamation	7	1	<1	<1	<1	<1	<1	9	<1	<1	9	8
<b>Federal CBNG Wells - Total Emissions</b>	<b>2,161</b>	<b>224</b>	<b>178</b>	<b>&lt;1</b>	<b>316</b>	<b>351</b>	<b>45</b>	<b>32,460</b>	<b>1,041</b>	<b>&lt;1</b>	<b>61,655</b>	<b>55,932</b>
Non-Federal CBNG Wells - Sub-total: Construction	10	2	8	<1	4	1	<1	1,107	<1	<1	1,110	1,007
Non-Federal CBNG Wells - Sub-total: Operations	1,931	200	155	<1	282	316	40	28,459	937	<1	54,732	49,652

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Non-Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Non-Federal CBNG Wells - Sub-total: Reclamation	6	1	<1	<1	<1	<1	<1	8	<1	<1	8	7
<b>Non-Federal CBNG Wells - Total Emissions</b>	<b>1,948</b>	<b>202</b>	<b>162</b>	<b>&lt;1</b>	<b>286</b>	<b>317</b>	<b>40</b>	<b>29,574</b>	<b>937</b>	<b>&lt;1</b>	<b>55,850</b>	<b>50,667</b>
Federal Sand and Gravel - Extraction and Processing Sub-total:	251	26	2	<1	1	<1	<1	215	<1	<1	216	196
Federal Sand and Gravel - Travel and Reclamation Sub-total:	7	<1	<1	<1	<1	<1	<1	32	<1	<1	32	29
<b>Federal Sand and Gravel - Total Emissions</b>	<b>258</b>	<b>26</b>	<b>2</b>	<b>&lt;1</b>	<b>1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>247</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>248</b>	<b>225</b>
Federal Coal Mining - Sub-total: Extraction and Processing	6,989	931	2,244	5	1,419	371	37	251,580	5	2	252,250	228,837
Federal Coal Mining - Sub-total: Travel and Reclamation	125	14	14	<1	9	2	<1	1,645	<1	<1	1,649	1,496
<b>Federal Coal Mining - Total Emissions</b>	<b>7,114</b>	<b>945</b>	<b>2,258</b>	<b>5</b>	<b>1,428</b>	<b>374</b>	<b>37</b>	<b>253,225</b>	<b>5</b>	<b>2</b>	<b>253,899</b>	<b>230,334</b>
<b>Federal Fire Management and Ecology - Total Emissions</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>5,920</b>	<b>1</b>	<b>&lt;1</b>	<b>5,997</b>	<b>5,440</b>
Federal Land Resources (ROW and RE) - Sub-total: Heavy Equipment	62	13	66	<1	37	10	1	7,812	<1	<1	7,833	7,106
Federal Land Resources (ROW and RE) - Sub-total: Commuting Vehicles	5	1	<1	<1	<1	<1	<1	80	<1	<1	80	73
<b>Federal Land Resources (ROW and RE) - Total Emissions</b>	<b>67</b>	<b>14</b>	<b>66</b>	<b>&lt;1</b>	<b>38</b>	<b>10</b>	<b>1</b>	<b>7,892</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>7,913</b>	<b>7,178</b>
Federal Livestock Grazing - Sub-total: Heavy Equipment	6	1	2	<1	1	<1	<1	216	<1	<1	216	196
Federal Livestock Grazing - Sub-total: Commuting Vehicles	9	1	2	<1	1	<1	<1	334	3,222	<1	90,550	82,145

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
<b>Federal Livestock Grazing - Total Emissions</b>	16	2	4	<1	2	<1	<1	550	3,222	<1	90,766	82,341
<b>Federal Trails and Roads -Total Emissions</b>	2	1	4	<1	3	1	<1	496	<1	<1	497	451
Federal Vegetation Management - Sub-total: Heavy Equipment	28	3	<1	<1	<1	<1	<1	35	<1	<1	35	32
Federal Vegetation Management - Sub-total: Commuting Vehicles	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<b>Federal Vegetation Management - Total Emissions</b>	28	3	<1	<1	<1	<1	<1	35	<1	<1	35	32
<b>Federal BLM General Purpose Travel - Total Emissions</b>	28	3	<1	<1	2	<1	<1	150	<1	<1	151	137

**Table P-5. Alternative C—Short-Year Air Emissions Summary, Total Annual Emissions, All Project Resources (Tons)**

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
Federal Oil Wells - Sub-total: Construction	127	15	68	<1	17	5	<1	8,374	<1	<1	8,402	7,622
Federal Oil Wells - Sub-total: Operations	183	36	4,968	1	2,610	419	36	227,153	1,009	2	256,034	232,270
Federal Oil Wells - Sub-total: Maintenance	225	32	112	<1	71	19	2	12,534	<1	<1	12,568	11,338
Federal Oil Wells - Sub-total: Reclamation	3	<1	1	<1	1	<1	<1	92	<1	<1	92	83
<b>Federal Oil Wells - Total Emissions</b>	<b>537</b>	<b>83</b>	<b>5,178</b>	<b>2</b>	<b>2,698</b>	<b>442</b>	<b>38</b>	<b>248,153</b>	<b>1,009</b>	<b>3</b>	<b>277,096</b>	<b>251,377</b>
Non-Federal Oil Wells - Sub-total: Construction	26	3	14	<1	4	1	<1	1,745	<1	<1	1,765	1,601
Non-Federal Oil Wells - Sub-total: Operations	81	16	2,208	1	1,153	185	16	100,370	446	1	113,131	102,631

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Non-Federal Oil Wells - Sub-total: Maintenance	99	14	49	<1	31	8	1	5,538	<1	<1	5,553	5,038
Non-Federal Oil Wells - Sub-total: Reclamation	1	<1	<1	<1	<1	<1	<1	41	<1	<1	41	37
<b>Non-Federal Oil Wells - Total Emissions</b>	<b>208</b>	<b>33</b>	<b>2,272</b>	<b>1</b>	<b>1,188</b>	<b>194</b>	<b>17</b>	<b>107,694</b>	<b>446</b>	<b>1</b>	<b>120,491</b>	<b>109,307</b>
Federal Natural Gas Wells - Sub-total: Construction	3,385	468	1,177	3	291	84	8	163,841	21	1	164,831	149,532
Federal Natural Gas Wells - Sub-total: Operations	4,247	5332	2,148	6	3,116	24,501	815	1,077,475	12,557	16	1,433,377	1,300,338
Federal Natural Gas Wells - Sub-total: Maintenance	105	15	52	<1	33	9	1	5,860	<1	<1	5,877	5,331
Federal Natural Gas Wells - Sub-total: Reclamation	16	2	4	<1	2	1	<1	403	<1	<1	401	367
<b>Federal Natural Gas Wells - Total Emissions</b>	<b>7,753</b>	<b>1,018</b>	<b>3,380</b>	<b>9</b>	<b>3,442</b>	<b>24,595</b>	<b>824</b>	<b>1,247,580</b>	<b>12,578</b>	<b>18</b>	<b>1,604,488</b>	<b>1,455,568</b>
Non-Federal Natural Gas Wells - Sub-total: Construction	784	109	268	1	66	19	2	37,341	5	1	37,842	34,329
Non-Federal Natural Gas Wells - Sub-total: Operations	1,915	260	1,257	4	1,641	10,934	363	840,273	5,602	14	1,000,804	907,915
Non-Federal Natural Gas Wells - Sub-total: Maintenance	47	7	23	<1	15	4	<1	2,611	<1	<1	2,618	2,375
Non-Federal Natural Gas Wells - Sub-total: Reclamation	7	1	2	<1	1	<1	<1	175	<1	<1	175	159
<b>Non-Federal Natural Gas Wells - Total Emissions</b>	<b>2,752</b>	<b>376</b>	<b>1,550</b>	<b>5</b>	<b>1,723</b>	<b>10,957</b>	<b>366</b>	<b>880,399</b>	<b>5,607</b>	<b>15</b>	<b>1,041,439</b>	<b>944,778</b>
Federal CBNG Wells - Sub-total: Construction	16	2	12	<1	5	1	<1	1,730	<1	<1	1,735	1,574
Federal CBNG Wells - Sub-total: Operations	2,432	251	195	<1	355	398	51	36,192	1,179	<1	69,278	62,848

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Federal CBNG Wells - Sub-total: Reclamation	11	1	<1	<1	<1	<1	<1	14	<1	<1	14	13
<b>Federal CBNG Wells - Total Emissions</b>	<b>2,460</b>	<b>255</b>	<b>207</b>	<b>&lt;1</b>	<b>360</b>	<b>399</b>	<b>51</b>	<b>37,936</b>	<b>1,180</b>	<b>&lt;1</b>	<b>71,028</b>	<b>64,435</b>
Non-Federal CBNG Wells - Sub-total: Construction	9	1	7	<1	3	1	<1	988	<1	<1	992	900
Non-Federal CBNG Wells - Sub-total: Operations	1,931	200	155	<1	282	316	40	28,740	937	<1	55,015	49,909
Non-Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Non-Federal CBNG Wells - Sub-total: Reclamation	8	1	<1	<1	<1	<1	<1	10	<1	<1	11	10
<b>Non-Federal CBNG Wells - Total Emissions</b>	<b>1,949</b>	<b>202</b>	<b>162</b>	<b>&lt;1</b>	<b>285</b>	<b>316</b>	<b>40</b>	<b>29,740</b>	<b>937</b>	<b>&lt;1</b>	<b>56,018</b>	<b>50,818</b>
Federal Sand and Gravel - Extraction and Processing Sub-total:	251	26	2	<1	1	<1	<1	215	<1	<1	216	196
Federal Sand and Gravel - Travel and Reclamation Sub-total:	7	<1	<1	<1	<1	<1	<1	32	<1	<1	32	29
<b>Federal Sand and Gravel - Total Emissions</b>	<b>258</b>	<b>26</b>	<b>2</b>	<b>&lt;1</b>	<b>1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>247</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>248</b>	<b>225</b>
Federal Coal Mining - Sub-total: Extraction and Processing	6,989	931	2,244	5	1,419	371	37	251,580	5	2	252,250	228,837
Federal Coal Mining - Sub-total: Travel and Reclamation	125	14	14	<1	9	2	<1	1,645	<1	<1	1,649	1,496
<b>Federal Coal Mining - Total Emissions</b>	<b>7,114</b>	<b>945</b>	<b>2,258</b>	<b>5</b>	<b>1,428</b>	<b>374</b>	<b>37</b>	<b>253,225</b>	<b>5</b>	<b>2</b>	<b>253,899</b>	<b>230,334</b>
<b>Federal Fire Management and Ecology - Total Emissions</b>	<b>1,203</b>	<b>945</b>	<b>343</b>	<b>83</b>	<b>10,816</b>	<b>557</b>	<b>56</b>	<b>11,340</b>	<b>572</b>	<b>83</b>	<b>49,372</b>	<b>44,790</b>
Federal Land Resources (ROW and RE) - Sub-total: Heavy Equipment	82	14	55	<1	31	9	1	6,556	<1	<1	6,573	5,963

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
Federal Land Resources (ROW and RE) - Sub-total: Commuting Vehicles	6	1	1	<1	1	<1	<1	207	<1	<1	208	189
<b>Federal Land Resources (ROW and RE) - Total Emissions</b>	<b>87</b>	<b>15</b>	<b>56</b>	<b>&lt;1</b>	<b>32</b>	<b>9</b>	<b>1</b>	<b>6,763</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>6,781</b>	<b>6,151</b>
Federal Livestock Grazing - Sub-total: Heavy Equipment	26	3	2	<1	1	<1	<1	216	<1	<1	216	196
Federal Livestock Grazing - Sub-total: Commuting Vehicles	38	4	8	<1	2	<1	<1	1,482	11,216	<1	315,535	286,248
<b>Federal Livestock Grazing - Total Emissions</b>	<b>64</b>	<b>7</b>	<b>9</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>1,698</b>	<b>11,216</b>	<b>&lt;1</b>	<b>315,751</b>	<b>286,444</b>
<b>Federal Trails and Roads -Total Emissions</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>496</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>497</b>	<b>451</b>
Federal Vegetation Management - Sub-total: Heavy Equipment	21	2	<1	<1	<1	<1	<1	35	<1	<1	35	32
Federal Vegetation Management - Sub-total: Commuting Vehicles	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<b>Federal Vegetation Management - Total Emissions</b>	<b>21</b>	<b>2</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>35</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>35</b>	<b>32</b>
<b>Federal BLM General Purpose Travel - Total Emissions</b>	<b>28</b>	<b>3</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>2</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>150</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>151</b>	<b>137</b>

**Table P-6. Alternative D—Short-Year Air Emissions Summary, Total Annual Emissions, All Project Resources (Tons)**

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
Federal Oil Wells - Sub-total: Construction	122	15	65	<1	16	4	<1	8,025	<1	<1	8,052	7,305
Federal Oil Wells - Sub-total: Operations	182	36	4,969	1	2,595	417	35	225,832	1,003	2	254,545	230,920
Federal Oil Wells - Sub-total: Maintenance	223	31	111	<1	70	18	2	12,462	<1	<1	12,495	11,335

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Federal Oil Wells - Sub-total: Reclamation	3	<1	1	<1	<1	<1	<1	88	<1	<1	89	80
<b>Federal Oil Wells - Total Emissions</b>	<b>530</b>	<b>82</b>	<b>5,146</b>	<b>2</b>	<b>2,682</b>	<b>439</b>	<b>38</b>	<b>246,407</b>	<b>1,003</b>	<b>3</b>	<b>275,181</b>	<b>249,640</b>
Non-Federal Oil Wells - Sub-total: Construction	26	3	14	<1	4	1	<1	1,745	<1	<1	1,765	1,601
Non-Federal Oil Wells - Sub-total: Operations	81	16	2,208	1	1,153	185	16	100,370	446	1	113,131	102,631
Non-Federal Oil Wells - Sub-total: Maintenance	99	14	49	<1	31	8	1	5,538	<1	<1	5,553	5,038
Non-Federal Oil Wells - Sub-total: Reclamation	1	<1	<1	<1	<1	<1	<1	39	<1	<1	39	36
<b>Non-Federal Oil Wells - Total Emissions</b>	<b>208</b>	<b>33</b>	<b>2,272</b>	<b>1</b>	<b>1,188</b>	<b>194</b>	<b>17</b>	<b>107,692</b>	<b>446</b>	<b>1</b>	<b>120,488</b>	<b>109,305</b>
Federal Natural Gas Wells - Sub-total: Construction	3,312	459	1,133	3	280	81	8	157,745	21	1	158,698	143,969
Federal Natural Gas Wells - Sub-total: Operations	4,230	531	2,140	6	3,104	24,406	812	1,073,281	12,508	16	1,427,801	1,295,279
Federal Natural Gas Wells - Sub-total: Maintenance	105	15	52	<1	33	9	1	5,838	<1	<1	5,854	5,311
Federal Natural Gas Wells - Sub-total: Reclamation	15	2	3	<1	2	1	<1	390	<1	<1	391	355
<b>Federal Natural Gas Wells - Total Emissions</b>	<b>7,662</b>	<b>1,006</b>	<b>3,328</b>	<b>8</b>	<b>3,419</b>	<b>24,496</b>	<b>821</b>	<b>1,237,254</b>	<b>12,529</b>	<b>18</b>	<b>1,592,744</b>	<b>1,444,914</b>
Non-Federal Natural Gas Wells - Sub-total: Construction	784	109	268	1	66	19	2	37,341	5	1	37,842	34,330
Non-Federal Natural Gas Wells - Sub-total: Operations	1,892	237	957	3	1,388	10,910	363	480,074	5,595	7	638,664	579,386
Non-Federal Natural Gas Wells - Sub-total: Maintenance	47	7	23	<1	15	4	<1	2,611	<1	<1	2,618	2,375
Non-Federal Natural Gas Wells - Sub-total: Reclamation	7	1	2	<1	1	<1	<1	175	<1	<1	175	159



Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
<b>Non-Federal Natural Gas Wells - Total Emissions</b>	<b>2,729</b>	<b>353</b>	<b>1,250</b>	<b>3</b>	<b>1,470</b>	<b>10,941</b>	<b>365</b>	<b>520,201</b>	<b>5,600</b>	<b>9</b>	<b>679,299</b>	<b>616,250</b>
Federal CBNG Wells - Sub-total: Construction	16	2	12	<1	5	1	<1	1,730	<1	<1	1,735	1,574
Federal CBNG Wells - Sub-total: Operations	2,360	244	189	<1	345	386	49	35,127	1,145	<1	67,241	61,000
Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Federal CBNG Wells - Sub-total: Reclamation	11	1	<1	<1	<1	<1	<1	14	<1	<1	14	13
<b>Federal CBNG Wells - Total Emissions</b>	<b>2,388</b>	<b>248</b>	<b>201</b>	<b>&lt;1</b>	<b>350</b>	<b>387</b>	<b>49</b>	<b>36,871</b>	<b>1,145</b>	<b>&lt;1</b>	<b>68,990</b>	<b>62,587</b>
Non-Federal CBNG Wells - Sub-total: Construction	9	1	7	<1	3	1	<1	988	<1	<1	992	900
Non-Federal CBNG Wells - Sub-total: Operations	1,931	200	155	<1	282	316	40	28,740	937	<1	55,015	49,909
Non-Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Non-Federal CBNG Wells - Sub-total: Reclamation	9	1	<1	<1	<1	<1	<1	11	<1	<1	11	10
<b>Non-Federal CBNG Wells - Total Emissions</b>	<b>1,950</b>	<b>202</b>	<b>162</b>	<b>&lt;1</b>	<b>285</b>	<b>316</b>	<b>40</b>	<b>29,740</b>	<b>937</b>	<b>&lt;1</b>	<b>56,017</b>	<b>50,819</b>
Federal Sand and Gravel - Extraction and Processing Sub-total:	251	26	2	<1	1	<1	<1	215	<1	<1	216	196
Federal Sand and Gravel - Travel and Reclamation Sub-total:	7	<1	<1	<1	<1	<1	<1	32	<1	<1	32	29
<b>Federal Sand and Gravel - Total Emissions</b>	<b>258</b>	<b>26</b>	<b>2</b>	<b>&lt;1</b>	<b>1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>247</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>248</b>	<b>225</b>
Federal Coal Mining - Sub-total: Extraction and Processing	6,989	931	2,244	5	1,419	371	37	251,580	5	2	252,250	228,837

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Federal Coal Mining - Sub-total: Travel and Reclamation	125	14	14	<1	9	2	<1	1,645	<1	<1	1,649	1,496
<b>Federal Coal Mining - Total Emissions</b>	<b>7,114</b>	<b>945</b>	<b>2,258</b>	<b>5</b>	<b>1,428</b>	<b>374</b>	<b>37</b>	<b>253,225</b>	<b>5</b>	<b>2</b>	<b>253,899</b>	<b>230,334</b>
<b>Federal Fire Management and Ecology - Total Emissions</b>	<b>274</b>	<b>194</b>	<b>85</b>	<b>17</b>	<b>2,174</b>	<b>114</b>	<b>11</b>	<b>9,172</b>	<b>115</b>	<b>17</b>	<b>16,845</b>	<b>15,281</b>
Federal Land Resources (ROW and RE) - Sub-total: Heavy Equipment	59	10	43	<1	24	7	1	5,079	<1	<1	5,093	4,620
Federal Land Resources (ROW and RE) - Sub-total: Commuting Vehicles	4	<1	<1	<1	1	<1	<1	114	<1	<1	114	103
<b>Federal Land Resources (ROW and RE) - Total Emissions</b>	<b>62</b>	<b>11</b>	<b>43</b>	<b>&lt;1</b>	<b>25</b>	<b>7</b>	<b>1</b>	<b>5,193</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>5,207</b>	<b>4,724</b>
Federal Livestock Grazing - Sub-total: Heavy Equipment	26	3	2	<1	1	<1	<1	216	<1	<1	216	196
Federal Livestock Grazing - Sub-total: Commuting Vehicles	38	4	8	<1	2	<1	<1	1,482	11,216	<1	315,535	286,248
<b>Federal Livestock Grazing - Total Emissions</b>	<b>64</b>	<b>7</b>	<b>9</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>1,698</b>	<b>11,216</b>	<b>&lt;1</b>	<b>315,751</b>	<b>286,444</b>
<b>Federal Trails and Roads -Total Emissions</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>496</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>497</b>	<b>451</b>
Federal Vegetation Management - Sub-total: Heavy Equipment	21	2	<1	<1	<1	<1	<1	35	<1	<1	35	32
Federal Vegetation Management - Sub-total: Commuting Vehicles	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<b>Federal Vegetation Management - Total Emissions</b>	<b>21</b>	<b>2</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>35</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>35</b>	<b>32</b>
<b>Federal BLM General Purpose Travel - Total Emissions</b>	<b>28</b>	<b>3</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>2</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>150</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>151</b>	<b>137</b>

Table P-7. Alternative A—Mid-year Air Emissions Summary, Total Annual Emissions, All Project Resources (Tons)

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
Federal Oil Wells - Sub-total: Construction	122	15	65	<1	16	4	<1	8,082	1	<1	8,117	7,364
Federal Oil Wells - Sub-total: Operations	551	88	9,194	2	4,799	1,060	74	419,697	1,856	4	472,829	428,943
Federal Oil Wells - Sub-total: Maintenance	412	58	205	<1	130	34	3	23,026	<1	<1	23,087	20,945
Federal Oil Wells - Sub-total: Reclamation	3	<1	1	<1	1	<1	<1	95	<1	<1	95	87
<b>Federal Oil Wells - Total Emissions</b>	<b>1,088</b>	<b>161</b>	<b>9,465</b>	<b>3</b>	<b>4,945</b>	<b>1,098</b>	<b>78</b>	<b>450,900</b>	<b>1,857</b>	<b>5</b>	<b>504,128</b>	<b>457,338</b>
Non-Federal Oil Wells - Sub-total: Construction	26	3	14	<1	4	1	<1	1,757	<1	<1	1,779	1,614
Non-Federal Oil Wells - Sub-total: Operations	188	30	3,142	1	1,640	362	25	143,441	634	2	161,600	146,601
Non-Federal Oil Wells - Sub-total: Maintenance	141	20	70	<1	44	12	1	7,870	<1	<1	7,891	7,158
Non-Federal Oil Wells - Sub-total: Reclamation	1	<1	<1	<1	<1	<1	<1	33	<1	<1	33	30
<b>Non-Federal Oil Wells - Total Emissions</b>	<b>357</b>	<b>53</b>	<b>3,227</b>	<b>1</b>	<b>1,688</b>	<b>375</b>	<b>26</b>	<b>153,100</b>	<b>635</b>	<b>2</b>	<b>171,302</b>	<b>155,402</b>
Federal Natural Gas Wells - Sub-total: Construction	3,331	461	1,147	3	302	89	8	165,366	50	2	167,178	151,662
Federal Natural Gas Wells - Sub-total: Operations	7,818	982	3,984	10	5,785	45,178	1,507	1,996,656	23,331	30	2,657,907	2,411,213
Federal Natural Gas Wells - Sub-total: Maintenance	193	27	96	<1	61	16	2	10,790	<1	<1	10,819	9,814
Federal Natural Gas Wells - Sub-total: Reclamation	17	2	4	<1	2	1	<1	424	<1	<1	425	386
<b>Federal Natural Gas Wells - Total Emissions</b>	<b>11,359</b>	<b>1,473</b>	<b>5,231</b>	<b>13</b>	<b>6,150</b>	<b>45,283</b>	<b>1,518</b>	<b>2,173,236</b>	<b>23,381</b>	<b>32</b>	<b>2,836,329</b>	<b>2,573,075</b>
Non-Federal Natural Gas Wells - Sub-total: Construction	781	108	269	1	71	21	2	38,770	12	1	39,474	35,810

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Non-Federal Natural Gas Wells - Sub-total: Operations	2,676	336	1,363	4	1,980	15,462	516	683,322	7,985	10	909,632	825,204
Non-Federal Natural Gas Wells - Sub-total: Maintenance	66	9	33	<1	21	5	1	3,693	<1	<1	3,703	3,359
Non-Federal Natural Gas Wells - Sub-total: Reclamation	6	1	1	<1	1	<1	<1	145	<1	<1	146	132
<b>Non-Federal Natural Gas Wells - Total Emissions</b>	<b>3,528</b>	<b>454</b>	<b>1,666</b>	<b>4</b>	<b>2,072</b>	<b>15,488</b>	<b>518</b>	<b>725,930</b>	<b>7,997</b>	<b>12</b>	<b>952,954</b>	<b>864,505</b>
Federal CBNG Wells - Sub-total: Construction	14	2	10	<1	4	1	<1	1,515	<1	<1	1,524	1,383
Federal CBNG Wells - Sub-total: Operations	4,865	503	400	<1	720	796	101	85,122	2,359	1	151,368	137,319
Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Federal CBNG Wells - Sub-total: Reclamation	12	1	<1	<1	<1	<1	<1	15	<1	<1	15	14
<b>Federal CBNG Wells - Total Emissions</b>	<b>4,891</b>	<b>507</b>	<b>411</b>	<b>&lt;1</b>	<b>724</b>	<b>797</b>	<b>102</b>	<b>86,653</b>	<b>2,360</b>	<b>1</b>	<b>152,908</b>	<b>138,716</b>
Non-Federal CBNG Wells - Sub-total: Construction	9	1	7	<1	3	1	<1	1,010	<1	<1	1,016	922
Non-Federal CBNG Wells - Sub-total: Operations	2,432	252	200	<1	360	398	51	42,561	1,180	<1	75,684	68,660
Non-Federal CBNG Wells - Sub-total: Maintenance	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Non-Federal CBNG Wells - Sub-total: Reclamation	6	1	<1	<1	<1	<1	<1	8	<1	<1	8	7
<b>Non-Federal CBNG Wells - Total Emissions</b>	<b>2,448</b>	<b>254</b>	<b>207</b>	<b>&lt;1</b>	<b>363</b>	<b>399</b>	<b>51</b>	<b>43,579</b>	<b>1,180</b>	<b>&lt;1</b>	<b>76,708</b>	<b>69,589</b>
Federal Sand and Gravel - Extraction and Processing Sub-total:	251	26	2	<1	1	<1	<1	215	<1	<1	216	196

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Federal Sand and Gravel - Travel and Reclamation Sub-total:	7	<1	<1	<1	<1	<1	<1	32	<1	<1	32	29
<b>Federal Sand and Gravel - Total Emissions</b>	<b>258</b>	<b>26</b>	<b>2</b>	<b>&lt;1</b>	<b>1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>247</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>248</b>	<b>225</b>
Federal Coal Mining - Sub-total: Extraction and Processing	6,989	931	2,244	5	1,419	371	37	251,580	5	2	252,250	228,8372
Federal Coal Mining - Sub-total: Travel and Reclamation	125	14	14	<1	9	2	<1	1,645	<1	<1	1,649	1,496
<b>Federal Coal Mining - Total Emissions</b>	<b>7,114</b>	<b>945</b>	<b>2,258</b>	<b>5</b>	<b>1,428</b>	<b>374</b>	<b>37</b>	<b>253,225</b>	<b>5</b>	<b>2</b>	<b>253,899</b>	<b>230,334</b>
<b>Federal Fire Management and Ecology - Total Emissions</b>	<b>274</b>	<b>194</b>	<b>85</b>	<b>17</b>	<b>2,174</b>	<b>114</b>	<b>11</b>	<b>9,172</b>	<b>115</b>	<b>17</b>	<b>16,845</b>	<b>15,281</b>
Federal Land Resources (ROW and RE) - Sub-total: Heavy Equipment	59	10	43	<1	24	7	1	5,079	<1	<1	5,093	4,620
Federal Land Resources (ROW and RE) - Sub-total: Commuting Vehicles	4	<1	<1	<1	1	<1	<1	114	<1	<1	114	103
<b>Federal Land Resources (ROW and RE) - Total Emissions</b>	<b>62</b>	<b>11</b>	<b>43</b>	<b>&lt;1</b>	<b>25</b>	<b>7</b>	<b>1</b>	<b>5,193</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>5,207</b>	<b>4,724</b>
Federal Livestock Grazing - Sub-total: Heavy Equipment	26	3	2	<1	1	<1	<1	216	<1	<1	216	196
Federal Livestock Grazing - Sub-total: Commuting Vehicles	38	4	8	<1	2	<1	<1	1,482	11,216	<1	315,535	286,248
<b>Federal Livestock Grazing - Total Emissions</b>	<b>64</b>	<b>7</b>	<b>9</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>1,698</b>	<b>11,216</b>	<b>&lt;1</b>	<b>315,751</b>	<b>286,444</b>
<b>Federal Trails and Roads -Total Emissions</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>496</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>497</b>	<b>451</b>
Federal Vegetation Management - Sub-total: Heavy Equipment	7	1	<1	<1	<1	<1	<1	35	<1	<1	35	32
Federal Vegetation Management - Sub-total: Commuting Vehicles	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
Federal Vegetation Management - Total Emissions	7	1	<1	<1	<1	<1	<1	35	<1	<1	35	32
Federal BLM General Purpose Travel - Total Emissions	28	3	<1	<1	2	<1	<1	150	<1	<1	151	137

**Table P-8. Alternative B—Mid-year Air Emissions Summary, Total Annual Emissions, All Project Resources (Tons)**

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
Federal Oil Wells - Sub-total: Construction	33	4	17	<1	4	1	<1	2,108	<1	<1	2,117	1,921
Federal Oil Wells - Sub-total: Operations	328	52	5,470	1	2,855	631	44	249,693	1,104	3	281,303	255,194
Federal Oil Wells - Sub-total: Maintenance	245	35	122	<1	77	20	2	13,700	<1	<1	13,736	12,461
Federal Oil Wells - Sub-total: Reclamation	1	<1	<1	<1	<1	<1	<1	32	<1	<1	32	29
<b>Federal Oil Wells - Total Emissions</b>	<b>607</b>	<b>91</b>	<b>5,609</b>	<b>2</b>	<b>2,937</b>	<b>652</b>	<b>46</b>	<b>265,533</b>	<b>1,105</b>	<b>3</b>	<b>297,189</b>	<b>269,605</b>
Non-Federal Oil Wells - Sub-total: Construction	27	3	14	<1	4	1	<1	1,757	<1	<1	1,765	1,601
Non-Federal Oil Wells - Sub-total: Operations	188	30	3,142	1	1,640	362	25	143,441	634	2	161,600	146,601
Non-Federal Oil Wells - Sub-total: Maintenance	141	20	70	<1	44	12	1	7,870	<1	<1	7,891	7,159
Non-Federal Oil Wells - Sub-total: Reclamation	1	<1	<1	<1	<1	<1	<1	18	<1	<1	18	17
<b>Non-Federal Oil Wells - Total Emissions</b>	<b>357</b>	<b>53</b>	<b>3,227</b>	<b>1</b>	<b>1,688</b>	<b>375</b>	<b>26</b>	<b>153,086</b>	<b>635</b>	<b>2</b>	<b>171,274</b>	<b>155,378</b>
Federal Natural Gas Wells - Sub-total: Construction	1,546	220	302	1	79	23	2	43,517	13	<1	43,994	39,911

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
Federal Natural Gas Wells - Sub-total: Operations	4,647	584	2,368	6	3,439	26,856	896	1,186,832	13,869	18	1,579,907	1,433,268
Federal Natural Gas Wells - Sub-total: Maintenance	115	16	57	<1	36	9	1	6,414	<1	<1	6,431	5,834
Federal Natural Gas Wells - Sub-total: Reclamation	6	1	1	<1	1	<1	<1	146	<1	<1	146	133
<b>Federal Natural Gas Wells - Total Emissions</b>	<b>6,314</b>	<b>820</b>	<b>2,728</b>	<b>7</b>	<b>3,555</b>	<b>26,889</b>	<b>899</b>	<b>1,236,909</b>	<b>13,882</b>	<b>18</b>	<b>1,630,479</b>	<b>1,479,146</b>
Non-Federal Natural Gas Wells - Sub-total: Construction	1,377	196	269	1	71	21	2	38,770	12	<1	39,205	35,566
Non-Federal Natural Gas Wells - Sub-total: Operations	2,673	336	1,362	4	1,978	15,446	515	682,620	7,977	10	908,697	824,356
Non-Federal Natural Gas Wells - Sub-total: Maintenance	66	9	33	<1	21	5	1	3,689	<1	<1	3,699	3,356
Non-Federal Natural Gas Wells - Sub-total: Reclamation	3	<1	1	<1	<1	<1	<1	84	<1	<1	84	76
<b>Non-Federal Natural Gas Wells - Total Emissions</b>	<b>4,120</b>	<b>541</b>	<b>1,665</b>	<b>4</b>	<b>2,070</b>	<b>15,472</b>	<b>518</b>	<b>725,163</b>	<b>7,988</b>	<b>11</b>	<b>951,685</b>	<b>863,355</b>
Federal CBNG Wells - Sub-total: Construction	7	1	6	<1	3	1	<1	830	<1	<1	835	758
Federal CBNG Wells - Sub-total: Operations	3,005	311	247	<1	445	491	63	52,575	1,457	<1	93,492	84,815
Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Federal CBNG Wells - Sub-total: Reclamation	7	1	<1	<1	<1	<1	<1	9	<1	<1	9	8
<b>Federal CBNG Wells - Total Emissions</b>	<b>3,020</b>	<b>313</b>	<b>253</b>	<b>&lt;1</b>	<b>447</b>	<b>492</b>	<b>63</b>	<b>53,415</b>	<b>1,457</b>	<b>&lt;1</b>	<b>94,337</b>	<b>85,581</b>
Non-Federal CBNG Wells - Sub-total: Construction	10	2	8	<1	4	1	<1	1,107	<1	<1	1,113	1,010

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Non-Federal CBNG Wells - Sub-total: Operations	2,361	244	194	<1	349	386	49	41,309	1,145	<1	73,458	66,640
Non-Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Non-Federal CBNG Wells - Sub-total: Reclamation	6	1	<1	<1	<1	<1	<1	7	<1	<1	7	6
<b>Non-Federal CBNG Wells - Total Emissions</b>	<b>2,377</b>	<b>247</b>	<b>202</b>	<b>&lt;1</b>	<b>353</b>	<b>387</b>	<b>49</b>	<b>42,424</b>	<b>1,145</b>	<b>&lt;1</b>	<b>74,579</b>	<b>67,657</b>
Federal Sand and Gravel - Extraction and Processing Sub-total:	251	26	2	<1	1	<1	<1	215	<1	<1	216	196
Federal Sand and Gravel - Travel and Reclamation Sub-total:	7	<1	<1	<1	<1	<1	<1	32	<1	<1	32	29
<b>Federal Sand and Gravel - Total Emissions</b>	<b>258</b>	<b>26</b>	<b>2</b>	<b>&lt;1</b>	<b>1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>247</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>248</b>	<b>225</b>
Federal Coal Mining - Sub-total: Extraction and Processing	6,989	931	2,244	5	1,419	371	37	251,580	5	2	252,250	228,837
Federal Coal Mining - Sub-total: Travel and Reclamation	125	14	14	<1	9	2	<1	1,645	<1	<1	1,649	1,496
<b>Federal Coal Mining - Total Emissions</b>	<b>7,114</b>	<b>945</b>	<b>2,258</b>	<b>5</b>	<b>1,428</b>	<b>374</b>	<b>37</b>	<b>253,225</b>	<b>5</b>	<b>2</b>	<b>253,899</b>	<b>230,334</b>
<b>Federal Fire Management and Ecology - Total Emissions</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>5,920</b>	<b>1</b>	<b>&lt;1</b>	<b>5,997</b>	<b>5,440</b>
Federal Land Resources (ROW and RE) - Sub-total: Heavy Equipment	62	13	66	<1	37	10	1	7,812	<1	<1	7,833	7,106
Federal Land Resources (ROW and RE) - Sub-total: Commuting Vehicles	5	1	<1	<1	<1	<1	<1	80	<1	<1	80	73
<b>Federal Land Resources (ROW and RE) - Total Emissions</b>	<b>67</b>	<b>14</b>	<b>66</b>	<b>&lt;1</b>	<b>38</b>	<b>10</b>	<b>1</b>	<b>7,892</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>7,913</b>	<b>7,178</b>
Federal Livestock Grazing - Sub-total: Heavy Equipment	6	1	2	<1	1	<1	<1	216	<1	<1	216	196



Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
Federal Livestock Grazing - Sub-total: Commuting Vehicles	9	1	2	<1	1	<1	<1	334	3,222	<1	90,550	82,145
<b>Federal Livestock Grazing - Total Emissions</b>	<b>16</b>	<b>2</b>	<b>4</b>	<b>&lt;1</b>	<b>2</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>550</b>	<b>3,222</b>	<b>&lt;1</b>	<b>90,766</b>	<b>82,341</b>
<b>Federal Trails and Roads -Total Emissions</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>496</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>497</b>	<b>451</b>
Federal Vegetation Management - Sub- total: Heavy Equipment	28	3	<1	<1	<1	<1	<1	35	<1	<1	35	32
Federal Vegetation Management - Sub- total: Commuting Vehicles	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<b>Federal Vegetation Management - Total Emissions</b>	<b>28</b>	<b>3</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>35</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>35</b>	<b>32</b>
<b>Federal BLM General Purpose Travel - Total Emissions</b>	<b>28</b>	<b>3</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>2</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>150</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>151</b>	<b>137</b>

**Table P-9. Alternative C—Mid-year Air Emissions Summary, Total Annual Emissions, All Project Resources (Tons)**

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
Federal Oil Wells - Sub-total: Construction	127	15	68	<1	17	5	<1	8,433	1	<1	8,470	7,684
Federal Oil Wells - Sub-total: Operations	560	89	9,339	2	4,874	1,077	75	426,337	1,885	4	480,310	435,730
Federal Oil Wells - Sub-total: Maintenance	419	59	209	<1	132	35	3	23,390	<1	<1	23,453	21,276
Federal Oil Wells - Sub-total: Reclamation	3	<1	1	<1	1	<1	<1	99	<1	<1	99	90

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
<b>Federal Oil Wells - Total Emissions</b>	<b>1,108</b>	<b>164</b>	<b>9,617</b>	<b>3</b>	<b>5,024</b>	<b>1,116</b>	<b>79</b>	<b>458,260</b>	<b>1,886</b>	<b>5</b>	<b>512,332</b>	<b>464,780</b>
Non-Federal Oil Wells - Sub-total: Construction	26	3	14	<1	4	1	<1	1,757	<1	<1	1,779	1,614
Non-Federal Oil Wells - Sub-total: Operations	188	30	3,142	1	1,640	362	25	143,441	634	2	161,600	146,601
Non-Federal Oil Wells - Sub-total: Maintenance	141	20	70	<1	44	12	1	7,870	<1	<1	7,891	7,158
Non-Federal Oil Wells - Sub-total: Reclamation	1	<1	<1	<1	<1	<1	<1	33	<1	<1	33	30
<b>Non-Federal Oil Wells - Total Emissions</b>	<b>357</b>	<b>53</b>	<b>3,227</b>	<b>1</b>	<b>1,688</b>	<b>375</b>	<b>26</b>	<b>153,101</b>	<b>635</b>	<b>2</b>	<b>171,303</b>	<b>155,404</b>
Federal Natural Gas Wells - Sub-total: Construction	3,386	469	1,180	3	311	91	9	170,113	51	2	171,978	156,015
Federal Natural Gas Wells - Sub-total: Operations	7,937	997	4,044	11	5,872	45,861	1,530	2,026,857	23,683	31	2,698,110	2,447,685
Federal Natural Gas Wells - Sub-total: Maintenance	196	28	98	<1	62	16	2	10,953	<1	<1	10,982	9,963
Federal Natural Gas Wells - Sub-total: Reclamation	17	2	4	<1	2	1	<1	435	<1	<1	436	396
<b>Federal Natural Gas Wells - Total Emissions</b>	<b>11,536</b>	<b>1,495</b>	<b>5,326</b>	<b>14</b>	<b>6,247</b>	<b>45,969</b>	<b>1,541</b>	<b>2,208,359</b>	<b>23,735</b>	<b>32</b>	<b>2,881,506</b>	<b>2,614,059</b>
Non-Federal Natural Gas Wells - Sub- total: Construction	772	107	269	1	71	21	2	38,770	12	1	39,484	35,819
Non-Federal Natural Gas Wells - Sub- total: Operations	2,684	337	1,368	4	1,986	15,510	517	685,429	8,009	10	912,436	827,748
Non-Federal Natural Gas Wells - Sub- total: Maintenance	66	9	33	<1	21	5	1	3,704	<1	<1	3,714	3,369
Non-Federal Natural Gas Wells - Sub- total: Reclamation	6	1	1	<1	1	<1	<1	147	<1	<1	148	134

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
<b>Non-Federal Natural Gas Wells - Total Emissions</b>	<b>3,528</b>	<b>454</b>	<b>1,671</b>	<b>4</b>	<b>2,078</b>	<b>15,536</b>	<b>520</b>	<b>728,051</b>	<b>8,021</b>	<b>12</b>	<b>955,782</b>	<b>867,071</b>
Federal CBNG Wells - Sub-total: Construction	16	2	12	<1	5	1	<1	1,730	<1	<1	1,740	1,579
Federal CBNG Wells - Sub-total: Operations	5,365	555	442	<1	794	878	112	93,885	2,602	1	166,951	151,455
Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Federal CBNG Wells - Sub-total: Reclamation	14	1	<1	<1	<1	<1	<1	17	<1	<1	17	16
<b>Federal CBNG Wells - Total Emissions</b>	<b>5,396</b>	<b>559</b>	<b>454</b>	<b>1</b>	<b>799</b>	<b>879</b>	<b>112</b>	<b>95,632</b>	<b>2,602</b>	<b>1</b>	<b>168,708</b>	<b>53,050</b>
Non-Federal CBNG Wells - Sub-total: Construction	9	1	7	<1	3	1	<1	988	<1	<1	994	902
Non-Federal CBNG Wells - Sub-total: Operations	2,575	267	212	<1	381	421	54	45,065	1,249	<1	80,136	72,699
Non-Federal CBNG Wells - Sub-total: Maintenance	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Non-Federal CBNG Wells - Sub-total: Reclamation	7	1	<1	<1	<1	<1	<1	8	<1	<1	8	7
<b>Non-Federal CBNG Wells - Total Emissions</b>	<b>2,591</b>	<b>269</b>	<b>219</b>	<b>&lt;1</b>	<b>384</b>	<b>422</b>	<b>54</b>	<b>46,062</b>	<b>1,249</b>	<b>&lt;1</b>	<b>81,139</b>	<b>73,608</b>
Federal Sand and Gravel - Extraction and Processing Sub-total:	251	26	2	<1	1	<1	<1	215	<1	<1	216	196
Federal Sand and Gravel - Travel and Reclamation Sub-total:	7	<1	<1	<1	<1	<1	<1	32	<1	<1	32	29
<b>Federal Sand and Gravel - Total Emissions</b>	<b>258</b>	<b>26</b>	<b>2</b>	<b>&lt;1</b>	<b>1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>247</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>248</b>	<b>225</b>
Federal Coal Mining - Sub-total: Extraction and Processing	6,989	931	2,244	5	1,419	371	37	251,580	5	2	252,250	228,837

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
Federal Coal Mining - Sub-total: Travel and Reclamation	125	14	14	<1	9	2	<1	1,645	<1	<1	1,649	1,496
<b>Federal Coal Mining - Total Emissions</b>	<b>7,114</b>	<b>945</b>	<b>2,258</b>	<b>5</b>	<b>1,428</b>	<b>374</b>	<b>37</b>	<b>253,225</b>	<b>5</b>	<b>2</b>	<b>253,899</b>	<b>230,334</b>
<b>Federal Fire Management and Ecology - Total Emissions</b>	<b>1,203</b>	<b>945</b>	<b>343</b>	<b>83</b>	<b>10,816</b>	<b>557</b>	<b>56</b>	<b>11,340</b>	<b>572</b>	<b>83</b>	<b>49,372</b>	<b>44,790</b>
Federal Land Resources (ROW and RE) - Sub-total: Heavy Equipment	82	14	55	<1	31	9	1	6,556	<1	<1	6,573	5,963
Federal Land Resources (ROW and RE) - Sub-total: Commuting Vehicles	6	1	1	<1	1	<1	<1	207	<1	<1	208	189
<b>Federal Land Resources (ROW and RE) - Total Emissions</b>	<b>87</b>	<b>15</b>	<b>56</b>	<b>&lt;1</b>	<b>32</b>	<b>9</b>	<b>1</b>	<b>6,763</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>6,781</b>	<b>6,151</b>
Federal Livestock Grazing - Sub-total: Heavy Equipment	26	3	2	<1	1	<1	<1	216	<1	<1	216	196
Federal Livestock Grazing - Sub-total: Commuting Vehicles	38	4	8	<1	2	<1	<1	1,482	11,216	<1	315,535	286,248
<b>Federal Livestock Grazing - Total Emissions</b>	<b>64</b>	<b>7</b>	<b>9</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>1,698</b>	<b>11,216</b>	<b>&lt;1</b>	<b>315,751</b>	<b>286,444</b>
<b>Federal Trails and Roads - Total Emissions</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>496</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>497</b>	<b>451</b>
Federal Vegetation Management - Sub-total: Heavy Equipment	21	2	<1	<1	<1	<1	<1	35	<1	<1	35	32
Federal Vegetation Management - Sub-total: Commuting Vehicles	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<b>Federal Vegetation Management - Total Emissions</b>	<b>21</b>	<b>2</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>35</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>35</b>	<b>32</b>
<b>Federal BLM General Purpose Travel - Total Emissions</b>	<b>28</b>	<b>3</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>2</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>150</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>151</b>	<b>137</b>

**Table P-10. Alternative D—Mid-year Air Emissions Summary, Total Annual Emissions, All Project Resources (Tons)**

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Federal Oil Wells - Sub-total: Construction	122	15	65	<1	16	4	<1	8,082	1	<1	8,117	7,364
Federal Oil Wells - Sub-total: Operations	548	87	9,136	2	4,768	1,053	73	417,040	1,844	4	469,836	426,228
Federal Oil Wells - Sub-total: Maintenance	410	58	204	<1	129	34	3	22,880	<1	<1	22,941	20,812
Federal Oil Wells - Sub-total: Reclamation	3	<1	1	<1	1	<1	<1	95	<1	<1	95	86
<b>Federal Oil Wells - Total Emissions</b>	<b>1,082</b>	<b>160</b>	<b>9,406</b>	<b>3</b>	<b>4,914</b>	<b>1,092</b>	<b>77</b>	<b>448,097</b>	<b>1,845</b>	<b>5</b>	<b>500,990</b>	<b>454,490</b>
Non-Federal Oil Wells - Sub-total: Construction	26	3	14	<1	4	1	<1	1,757	<1	<1	1,779	1,614
Non-Federal Oil Wells - Sub-total: Operations	188	30	3,142	1	1,640	362	25	143,441	634	2	161,600	146,601
Non-Federal Oil Wells - Sub-total: Maintenance	141	20	70	<1	44	12	1	7,870	<1	<1	7,891	7,158
Non-Federal Oil Wells - Sub-total: Reclamation	1	<1	<1	<1	<1	<1	<1	32	<1	<1	32	30
<b>Non-Federal Oil Wells - Total Emissions</b>	<b>357</b>	<b>53</b>	<b>3,227</b>	<b>1</b>	<b>1,688</b>	<b>375</b>	<b>26</b>	<b>153,100</b>	<b>635</b>	<b>2</b>	<b>171,302</b>	<b>155,402</b>
Federal Natural Gas Wells - Sub-total: Construction	3,3125	459	1,136	3	299	88	8	163,784	50	2	165,578	150,210
Federal Natural Gas Wells - Sub-total: Operations	7,777	977	3,963	10	5,754	44,940	1,499	1,986,120	23,207	30	2,643,882	2,398,490
Federal Natural Gas Wells - Sub-total: Maintenance	192	27	96	<1	61	16	2	10,733	<1	<1	10,761	9,763
Federal Natural Gas Wells - Sub-total: Reclamation	17	2	4	<1	2	1	<1	420	<1	<1	421	382
<b>Federal Natural Gas Wells - Total Emissions</b>	<b>11,298</b>	<b>1,465</b>	<b>5,199</b>	<b>13</b>	<b>6,116</b>	<b>45,044</b>	<b>1,509</b>	<b>2,161,057</b>	<b>23,257</b>	<b>32</b>	<b>2,820,643</b>	<b>2,558,845</b>
Non-Federal Natural Gas Wells - Sub-total: Construction	784	109	269	1	71	21	2	38,770	12	1	39,470	35,807

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Non-Federal Natural Gas Wells - Sub-total: Operations	2,684	337	1,368	4	1,986	15,510	517	685,429	8,009	10	912,436	827,748
Non-Federal Natural Gas Wells - Sub-total: Maintenance	66	9	33	<1	21	5	1	3,704	<1	<1	3,714	3,369
Non-Federal Natural Gas Wells - Sub-total: Reclamation	6	1	1	<1	1	<1	<1	145	<1	<1	145	132
<b>Non-Federal Natural Gas Wells - Total Emissions</b>	<b>3,540</b>	<b>456</b>	<b>1,671</b>	<b>4</b>	<b>2,078</b>	<b>15,536</b>	<b>520</b>	<b>728,048</b>	<b>8,021</b>	<b>12</b>	<b>955,766</b>	<b>867,056</b>
Federal CBNG Wells - Sub-total: Construction	16	2	12	<1	5	1	<1	1,730	<1	<1	1,740	1,579
Federal CBNG Wells - Sub-total: Operations	5,151	533	424	<1	762	843	107	90,129	2,498	1	160,273	145,397
Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Federal CBNG Wells - Sub-total: Reclamation	14	1	<1	<1	<1	<1	<1	17	<1	<1	17	15
<b>Federal CBNG Wells - Total Emissions</b>	<b>5,181</b>	<b>537</b>	<b>436</b>	<b>1</b>	<b>767</b>	<b>844</b>	<b>108</b>	<b>91,876</b>	<b>2,498</b>	<b>1</b>	<b>162,030</b>	<b>146,991</b>
Non-Federal CBNG Wells - Sub-total: Construction	9	1	7	<1	3	1	<1	988	<1	<1	994	902
Non-Federal CBNG Wells - Sub-total: Operations	2,575	267	212	<1	381	421	54	45,065	1,249	<1	80,136	72,699
Non-Federal CBNG Wells - Sub-total: Maintenance	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Non-Federal CBNG Wells - Sub-total: Reclamation	7	1	<1	<1	<1	<1	<1	8	<1	<1	8	8
<b>Non-Federal CBNG Wells - Total Emissions</b>	<b>2,592</b>	<b>269</b>	<b>219</b>	<b>&lt;1</b>	<b>384</b>	<b>422</b>	<b>54</b>	<b>46,062</b>	<b>1,249</b>	<b>&lt;1</b>	<b>81,139</b>	<b>73,608</b>
Federal Sand and Gravel - Extraction and Processing Sub-total:	251	26	2	<1	1	<1	<1	215	<1	<1	216	196

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Federal Sand and Gravel - Travel and Reclamation Sub-total:	7	<1	<1	<1	<1	<1	<1	32	<1	<1	32	29
<b>Federal Sand and Gravel - Total Emissions</b>	<b>258</b>	<b>26</b>	<b>2</b>	<b>&lt;1</b>	<b>1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>247</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>248</b>	<b>225</b>
Federal Coal Mining - Sub-total: Extraction and Processing	6,989	931	2,244	5	1,419	371	37	251,580	5	2	252,250	228,837
Federal Coal Mining - Sub-total: Travel and Reclamation	125	14	14	<1	9	2	<1	1,645	<1	<1	1,649	1,496
<b>Federal Coal Mining - Total Emissions</b>	<b>7,114</b>	<b>945</b>	<b>2,258</b>	<b>5</b>	<b>1,428</b>	<b>374</b>	<b>37</b>	<b>253,225</b>	<b>5</b>	<b>2</b>	<b>253,899</b>	<b>230,334</b>
<b>Federal Fire Management and Ecology - Total Emissions</b>	<b>274</b>	<b>194</b>	<b>85</b>	<b>17</b>	<b>2,174</b>	<b>114</b>	<b>11</b>	<b>9,172</b>	<b>115</b>	<b>17</b>	<b>16,845</b>	<b>15,281</b>
Federal Land Resources (ROW and RE) - Sub-total: Heavy Equipment	59	10	43	<1	24	7	1	5,079	<1	<1	5,093	4,620
Federal Land Resources (ROW and RE) - Sub-total: Commuting Vehicles	4	<1	<1	<1	1	<1	<1	114	<1	<1	114	103
<b>Federal Land Resources (ROW and RE) - Total Emissions</b>	<b>62</b>	<b>11</b>	<b>43</b>	<b>&lt;1</b>	<b>25</b>	<b>7</b>	<b>1</b>	<b>5,193</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>5,207</b>	<b>4,724</b>
Federal Livestock Grazing - Sub-total: Heavy Equipment	26	3	2	<1	1	<1	<1	216	<1	<1	216	196
Federal Livestock Grazing - Sub-total: Commuting Vehicles	38	4	8	<1	2	<1	<1	1,482	11,216	<1	315,535	286,248
<b>Federal Livestock Grazing - Total Emissions</b>	<b>64</b>	<b>7</b>	<b>9</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>1,698</b>	<b>11,216</b>	<b>&lt;1</b>	<b>315,751</b>	<b>286,444</b>
<b>Federal Trails and Roads -Total Emissions</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>496</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>497</b>	<b>451</b>
Federal Vegetation Management - Sub-total: Heavy Equipment	21	2	<1	<1	<1	<1	<1	35	<1	<1	35	32
Federal Vegetation Management - Sub-total: Commuting Vehicles	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
<b>Federal Vegetation Management - Total Emissions</b>	21	2	<1	<1	<1	<1	<1	35	<1	<1	35	32
<b>Federal BLM General Purpose Travel - Total Emissions</b>	28	3	<1	<1	2	<1	<1	150	<1	<1	151	137

**Table P-11. Alternative A—Long-year Air Emissions Summary, Total Annual Emissions, All Project Resources (Tons)**

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
Federal Oil Wells - Sub-total: Construction	122	15	65	<1	16	4	<1	8,082	1	<1	8,117	7,364
Federal Oil Wells - Sub-total: Operations	833	133	13,907	3	7,258	1,603	112	634,857	2,807	7	715,228	648,844
Federal Oil Wells - Sub-total: Maintenance	623	88	311	1	196	51	5	34,829	1	<1	34,922	31,681
Federal Oil Wells - Sub-total: Reclamation	3	<1	1	<1	1	<1	<1	98	<1	<1	98	89
<b>Federal Oil Wells - Total Emissions</b>	<b>1,581</b>	<b>236</b>	<b>14,284</b>	<b>4</b>	<b>7,472</b>	<b>1,659</b>	<b>117</b>	<b>677,867</b>	<b>2,808</b>	<b>7</b>	<b>758,365</b>	<b>687,978</b>
Non-Federal Oil Wells - Sub-total: Construction	26	3	14	<1	4	1	<1	1,757	<1	<1	1,779	1,614
Non-Federal Oil Wells - Sub-total: Operations	251	40	4,190	1	2,187	483	34	191,254	846	2	215,466	195,486
Non-Federal Oil Wells - Sub-total: Maintenance	188	26	94	<1	59	15	2	10,492	<1	<1	10,520	9,544
Non-Federal Oil Wells - Sub-total: Reclamation	1	<1	<1	<1	<1	<1	<1	30	<1	<1	30	27
<b>Non-Federal Oil Wells - Total Emissions</b>	<b>466</b>	<b>70</b>	<b>4,298</b>	<b>1</b>	<b>2,250</b>	<b>499</b>	<b>35</b>	<b>203,533</b>	<b>846</b>	<b>2</b>	<b>227,795</b>	<b>206,652</b>
Federal Natural Gas Wells - Sub-total: Construction	3,331	461	1,147	3	302	89	8	165,366	50	2	167,178	151,704
Federal Natural Gas Wells - Sub-total: Operations	11,835	1,487	6,030	16	8,757	68,395	2,282	3,022,623	35,320	46	4,023,687	3,650,228



Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Federal Natural Gas Wells - Sub-total: Maintenance	292	41	146	<1	92	24	2	16,334	<1	<1	16,377	14,857
Federal Natural Gas Wells - Sub-total: Reclamation	17	2	4	<1	2	1	<1	438	<1	<1	439	398
<b>Federal Natural Gas Wells - Total Emissions</b>	<b>15,475</b>	<b>1,991</b>	<b>7,327</b>	<b>19</b>	<b>9,154</b>	<b>68,508</b>	<b>2,293</b>	<b>3,204,761</b>	<b>35,370</b>	<b>47</b>	<b>4,207,681</b>	<b>3,817,145</b>
Non-Federal Natural Gas Wells - Sub-total: Construction	781	108	269	1	71	21	2	38,770	12	1	39,474	35,810
Non-Federal Natural Gas Wells - Sub-total: Operations	3,558	447	1,813	5	2,633	20,563	686	908,740	10,619	14	1,209,711	1,097,431
Non-Federal Natural Gas Wells - Sub-total: Maintenance	88	12	44	<1	28	7	1	4,911	<1	<1	4,924	4,467
Non-Federal Natural Gas Wells - Sub-total: Reclamation	5	1	1	<1	1	<1	<1	132	<1	<1	132	120
<b>Non-Federal Natural Gas Wells - Total Emissions</b>	<b>4,432</b>	<b>568</b>	<b>2,127</b>	<b>5</b>	<b>2,732</b>	<b>20,591</b>	<b>689</b>	<b>952,553</b>	<b>10,631</b>	<b>15</b>	<b>1,254,240</b>	<b>1,137,828</b>
Federal CBNG Wells - Sub-total: Construction	14	2	10	<1	4	1	<1	1,515	<1	<1	1,524	1,383
Federal CBNG Wells - Sub-total: Operations	7,154	740	589	1	1,059	1,170	149	125,179	3,470	1	222,600	201,940
Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Federal CBNG Wells - Sub-total: Reclamation	12	1	<1	<1	<1	<1	<1	15	<1	<1	15	13
<b>Federal CBNG Wells - Total Emissions</b>	<b>7,180</b>	<b>744</b>	<b>599</b>	<b>1</b>	<b>1,063</b>	<b>1,171</b>	<b>149</b>	<b>126,709</b>	<b>3,470</b>	<b>1</b>	<b>224,139</b>	<b>203,336</b>
Non-Federal CBNG Wells - Sub-total: Construction	9	1	7	<1	3	1	<1	1,010	<1	<1	1,016	922
Non-Federal CBNG Wells - Sub-total: Operations	4,221	437	347	<1	625	690	88	73,856	2,047	1	131,334	119,144

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Non-Federal CBNG Wells - Sub-total: Maintenance	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Non-Federal CBNG Wells - Sub-total: Reclamation	7	1	<1	<1	<1	<1	<1	9	<1	<1	9	8
<b>Non-Federal CBNG Wells - Total Emissions</b>	<b>4,237</b>	<b>439</b>	<b>354</b>	<b>&lt;1</b>	<b>628</b>	<b>691</b>	<b>88</b>	<b>74,874</b>	<b>2,047</b>	<b>1</b>	<b>132,359</b>	<b>120,074</b>
Federal Sand and Gravel - Extraction and Processing Sub-total:	251	26	2	<1	1	<1	<1	215	<1	<1	216	196
Federal Sand and Gravel - Travel and Reclamation Sub-total:	7	<1	<1	<1	<1	<1	<1	32	<1	<1	32	29
<b>Federal Sand and Gravel - Total Emissions</b>	<b>258</b>	<b>26</b>	<b>2</b>	<b>&lt;1</b>	<b>1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>247</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>248</b>	<b>225</b>
Federal Coal Mining - Sub-total: Extraction and Processing	6,989	931	2,244	5	1,419	371	37	251,580	5	2	252,250	228,837
Federal Coal Mining - Sub-total: Travel and Reclamation	125	14	14	<1	9	2	<1	1,645	<1	<1	1,649	1,496
<b>Federal Coal Mining - Total Emissions</b>	<b>7,114</b>	<b>945</b>	<b>2,258</b>	<b>5</b>	<b>1,428</b>	<b>374</b>	<b>37</b>	<b>253,225</b>	<b>5</b>	<b>2</b>	<b>253,899</b>	<b>230,3334</b>
<b>Federal Fire Management and Ecology - Total Emissions</b>	<b>274</b>	<b>194</b>	<b>85</b>	<b>17</b>	<b>2,174</b>	<b>114</b>	<b>11</b>	<b>9,172</b>	<b>115</b>	<b>17</b>	<b>16,845</b>	<b>15,281</b>
Federal Land Resources (ROW and RE) - Sub-total: Heavy Equipment	59	10	43	<1	24	7	1	5,079	<1	<1	5,093	4,620
Federal Land Resources (ROW and RE) - Sub-total: Commuting Vehicles	4	<1	<1	<1	1	<1	<1	114	<1	<1	114	103
<b>Federal Land Resources (ROW and RE) - Total Emissions</b>	<b>62</b>	<b>11</b>	<b>43</b>	<b>&lt;1</b>	<b>25</b>	<b>7</b>	<b>1</b>	<b>5,193</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>5,207</b>	<b>4,724</b>
Federal Livestock Grazing - Sub-total: Heavy Equipment	26	3	2	<1	1	<1	<1	216	<1	<1	216	196
Federal Livestock Grazing - Sub-total: Commuting Vehicles	38	4	8	<1	2	<1	<1	1,482	11,216	<1	315,535	286,248

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
<b>Federal Livestock Grazing - Total Emissions</b>	<b>64</b>	<b>7</b>	<b>9</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>1,698</b>	<b>11,216</b>	<b>&lt;1</b>	<b>315,751</b>	<b>286,444</b>
<b>Federal Trails and Roads -Total Emissions</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>496</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>497</b>	<b>451</b>
Federal Vegetation Management - Sub-total: Heavy Equipment	7	1	<1	<1	<1	<1	<1	35	<1	<1	35	32
Federal Vegetation Management - Sub-total: Commuting Vehicles	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<b>Federal Vegetation Management - Total Emissions</b>	<b>7</b>	<b>1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>35</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>35</b>	<b>32</b>
<b>Federal BLM General Purpose Travel - Total Emissions</b>	<b>28</b>	<b>3</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>2</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>150</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>151</b>	<b>137</b>

**Table P-12. Alternative B—Long-year Air Emissions Summary, Total Annual Emissions, All Project Resources (Tons)**

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
Federal Oil Wells - Sub-total: Construction	33	4	17	<1	4	1	<1	2,108	<1	<1	2,117	1,921
Federal Oil Wells - Sub-total: Operations	387	62	6,459	2	3,371	745	52	294,850	1,304	3	332,177	301,346
Federal Oil Wells - Sub-total: Maintenance	290	41	144	<1	91	24	2	16,177	<1	<1	16,220	14,715
Federal Oil Wells - Sub-total: Reclamation	1	<1	<1	<1	<1	<1	<1	30	<1	<1	31	28
<b>Federal Oil Wells - Total Emissions</b>	<b>711</b>	<b>107</b>	<b>6,620</b>	<b>2</b>	<b>3,467</b>	<b>770</b>	<b>54</b>	<b>313,166</b>	<b>1,304</b>	<b>3</b>	<b>350,545</b>	<b>318,009</b>
Non-Federal Oil Wells - Sub-total: Construction	27	3	14	<1	4	1	<1	1,757	<1	<1	1,765	1,601
Non-Federal Oil Wells - Sub-total: Operations	251	40	4,190	1	2,187	483	34	191,254	846	2	215,466	195,468

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Non-Federal Oil Wells - Sub-total: Maintenance	188	26	94	<1	59	15	2	10,493	<1	<1	10,521	9,545
Non-Federal Oil Wells - Sub-total: Reclamation	1	<1	<1	<1	<1	<1	<1	20	<1	<1	20	18
<b>Non-Federal Oil Wells - Total Emissions</b>	<b>467</b>	<b>70</b>	<b>4,298</b>	<b>1</b>	<b>2,250</b>	<b>499</b>	<b>35</b>	<b>203,524</b>	<b>846</b>	<b>2</b>	<b>227,772</b>	<b>206,632</b>
Federal Natural Gas Wells - Sub-total: Construction	1,546	220	302	1	79	23	2	43,517	13	<1	43,994	39,911
Federal Natural Gas Wells - Sub-total: Operations	5,491	690	2,798	7	4,063	31,734	1,059	1,402,418	16,388	21	1,866,899	1,693,623
Federal Natural Gas Wells - Sub-total: Maintenance	136	19	68	<1	43	11	1	7,579	<1	<1	7,599	6,894
Federal Natural Gas Wells - Sub-total: Reclamation	6	1	1	<1	1	<1	<1	139	<1	<1	140	127
<b>Federal Natural Gas Wells - Total Emissions</b>	<b>7,178</b>	<b>929</b>	<b>3,168</b>	<b>8</b>	<b>4,186</b>	<b>31,769</b>	<b>1,062</b>	<b>1,453,654</b>	<b>16,401</b>	<b>22</b>	<b>1,918,632</b>	<b>1,740,554</b>
Non-Federal Natural Gas Wells - Sub-total: Construction	1,377	196	269	1	71	21	2	38,770	12	<1	39,205	35,566
Non-Federal Natural Gas Wells - Sub-total: Operations	3,555	447	1,812	5	2,631	20,547	686	908,038	10,611	14	1,208,776	1,096,583
Non-Federal Natural Gas Wells - Sub-total: Maintenance	88	12	44	<1	28	7	1	4,907	<1	<1	4,920	4,464
Non-Federal Natural Gas Wells - Sub-total: Reclamation	4	<1	1	<1	1	<1	<1	90	<1	<1	90	82
<b>Non-Federal Natural Gas Wells - Total Emissions</b>	<b>5,024</b>	<b>655</b>	<b>2,125</b>	<b>5</b>	<b>2,730</b>	<b>20,575</b>	<b>688</b>	<b>951,806</b>	<b>10,623</b>	<b>14</b>	<b>1,252,992</b>	<b>1,136,696</b>
Federal CBNG Wells - Sub-total: Construction	7	1	6	<1	3	1	<1	830	<1	<1	835	758
Federal CBNG Wells - Sub-total: Operations	3,505	363	289	<1	519	573	73	61,338	1,700	1	109,074	98,950
Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Federal CBNG Wells - Sub-total: Reclamation	6	1	<1	<1	<1	<1	<1	7	<1	<1	7	7
<b>Federal CBNG Wells - Total Emissions</b>	<b>3,519</b>	<b>365</b>	<b>294</b>	<b>&lt;1</b>	<b>521</b>	<b>574</b>	<b>73</b>	<b>62,176</b>	<b>1,700</b>	<b>1</b>	<b>109,917</b>	<b>99,715</b>
Non-Federal CBNG Wells - Sub-total: Construction	10	2	8	<1	4	1	<1	1,107	<1	<1	1,113	1,010
Non-Federal CBNG Wells - Sub-total: Operations	4,149	429	342	<1	614	679	87	72,604	2,012	1	129,108	117,125
Non-Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Non-Federal CBNG Wells - Sub-total: Reclamation	7	1	<1	<1	<1	<1	<1	9	<1	<1	9	8
<b>Non-Federal CBNG Wells - Total Emissions</b>	<b>4,167</b>	<b>432</b>	<b>349</b>	<b>&lt;1</b>	<b>618</b>	<b>680</b>	<b>87</b>	<b>73,720</b>	<b>2,013</b>	<b>1</b>	<b>130,231</b>	<b>118,143</b>
Federal Sand and Gravel - Extraction and Processing Sub-total:	251	26	2	<1	1	<1	<1	215	<1	<1	216	196
Federal Sand and Gravel - Travel and Reclamation Sub-total:	7	<1	<1	<1	<1	<1	<1	32	<1	<1	32	29
<b>Federal Sand and Gravel - Total Emissions</b>	<b>258</b>	<b>26</b>	<b>2</b>	<b>&lt;1</b>	<b>1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>247</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>248</b>	<b>225</b>
Federal Coal Mining - Sub-total: Extraction and Processing	6,989	931	2,244	5	1,419	371	37	251,580	5	2	252,250	228,837
Federal Coal Mining - Sub-total: Travel and Reclamation	125	14	14	<1	9	2	<1	1,645	<1	<1	1,649	1,496
<b>Federal Coal Mining - Total Emissions</b>	<b>7,114</b>	<b>945</b>	<b>2,258</b>	<b>5</b>	<b>1,428</b>	<b>374</b>	<b>37</b>	<b>253,225</b>	<b>5</b>	<b>2</b>	<b>253,899</b>	<b>230,334</b>
<b>Federal Fire Management and Ecology - Total Emissions</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>5,920</b>	<b>1</b>	<b>&lt;1</b>	<b>5,997</b>	<b>5,440</b>
Federal Land Resources (ROW and RE) - Sub-total: Heavy Equipment	62	13	66	<1	37	10	1	7,812	<1	<1	7,833	7,106
Federal Land Resources (ROW and RE) - Sub-total: Commuting Vehicles	5	1	<1	<1	<1	<1	<1	80	<1	<1	80	73

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
<b>Federal Land Resources (ROW and RE) - Total Emissions</b>	<b>67</b>	<b>14</b>	<b>66</b>	<b>&lt;1</b>	<b>38</b>	<b>10</b>	<b>1</b>	<b>7,892</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>7,913</b>	<b>7,178</b>
Federal Livestock Grazing - Sub-total: Heavy Equipment	6	1	2	<1	1	<1	<1	216	<1	<1	216	196
Federal Livestock Grazing - Sub-total: Commuting Vehicles	9	1	2	<1	1	<1	<1	334	3,222	<1	90,550	82,145
<b>Federal Livestock Grazing - Total Emissions</b>	<b>16</b>	<b>2</b>	<b>4</b>	<b>&lt;1</b>	<b>2</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>550</b>	<b>3,222</b>	<b>&lt;1</b>	<b>90,766</b>	<b>82,341</b>
<b>Federal Trails and Roads -Total Emissions</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>496</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>497</b>	<b>451</b>
Federal Vegetation Management - Sub-total: Heavy Equipment	28	3	<1	<1	<1	<1	<1	35	<1	<1	35	32
Federal Vegetation Management - Sub-total: Commuting Vehicles	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<b>Federal Vegetation Management - Total Emissions</b>	<b>28</b>	<b>3</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>35</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>35</b>	<b>32</b>
<b>Federal BLM General Purpose Travel - Total Emissions</b>	<b>28</b>	<b>3</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>2</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>150</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>151</b>	<b>137</b>

**Table P-13. Alternative C—Long-year Air Emissions Summary, Total Annual Emissions, All Project Resources (Tons)**

Activity	Criteria Pollutants					Organics		Greenhouse Gases				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	CO <sub>2eq</sub> metric tonnes
Federal Oil Wells - Sub-total: Construction	127	15	68	<1	17	5	<1	8,433	1	<1	8,470	7,684
Federal Oil Wells - Sub-total: Operations	851	136	14,198	3	7,410	1,637	114	648,139	2,866	7	730,191	662,418
Federal Oil Wells - Sub-total: Maintenance	636	90	317	1	201	53	5	35,558	1	<1	35,652	32,343
Federal Oil Wells - Sub-total: Reclamation	3	<1	1	<1	1	<1	<1	102	<1	<1	102	93

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
<b>Federal Oil Wells - Total Emissions</b>	<b>1,617</b>	<b>241</b>	<b>14,584</b>	<b>4</b>	<b>7,629</b>	<b>1,694</b>	<b>120</b>	<b>692,232</b>	<b>2,867</b>	<b>7</b>	<b>774,416</b>	<b>702,538</b>
Non-Federal Oil Wells - Sub-total: Construction	26	3	14	<1	4	1	<1	1,757	<1	<1	1,779	1,614
Non-Federal Oil Wells - Sub-total: Operations	253	40	4,219	1	2,202	486	34	192,582	852	2	216,963	196,825
Non-Federal Oil Wells - Sub-total: Maintenance	189	27	94	<1	60	16	2	10,565	<1	<1	10,593	9,610
Non-Federal Oil Wells - Sub-total: Reclamation	1	<1	<1	<1	<1	<1	<1	30	<1	<1	30	28
<b>Non-Federal Oil Wells - Total Emissions</b>	<b>469</b>	<b>70</b>	<b>4,327</b>	<b>1</b>	<b>2,265</b>	<b>503</b>	<b>36</b>	<b>204,935</b>	<b>852</b>	<b>2</b>	<b>229,366</b>	<b>208,077</b>
Federal Natural Gas Wells - Sub-total: Construction	3,386	469	1,180	3	3,386	91	9	170,113	51	2	171,978	156,015
Federal Natural Gas Wells - Sub-total: Operations	12,072	1,516	6,151	16	12,072	69,761	2,328	3,083,021	36,026	47	4,104,088	3,723,167
Federal Natural Gas Wells - Sub-total: Maintenance	298	42	149	<1	298	25	2	16,660	<1	<1	16,705	15,154
Federal Natural Gas Wells - Sub-total: Reclamation	18	2	4	<1	3	1	<1	446	<1	<1	450	409
<b>Federal Natural Gas Wells - Total Emissions</b>	<b>15,773</b>	<b>2,029</b>	<b>7,484</b>	<b>19</b>	<b>9,340</b>	<b>69,878</b>	<b>2,339</b>	<b>3,270,244</b>	<b>36,078</b>	<b>48</b>	<b>4,293,220</b>	<b>3,894,745</b>
Non-Federal Natural Gas Wells - Sub-total: Construction	772	107	269	1	71	21	2	38,770	12	1	39,484	35,819
Non-Federal Natural Gas Wells - Sub-total: Operations	3,580	450	1,824	5	2,649	20,690	690	914,358	10,685	14	1,217,189	1,104,216
Non-Federal Natural Gas Wells - Sub-total: Maintenance	88	12	44	<1	28	7	1	4,941	<1	<1	4,954	4,494
Non-Federal Natural Gas Wells - Sub-total: Reclamation	5	1	1	<1	1	<1	<1	133	<1	<1	134	121
<b>Non-Federal Natural Gas Wells - Total Emissions</b>	<b>4,445</b>	<b>570</b>	<b>2,138</b>	<b>6</b>	<b>2,749</b>	<b>20,718</b>	<b>693</b>	<b>958,203</b>	<b>10,696</b>	<b>15</b>	<b>1,261,761</b>	<b>1,144,651</b>

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Federal CBNG Wells - Sub-total: Construction	16	2	12	<1	5	1	<1	1,730	<1	<1	1,740	1,579
Federal CBNG Wells - Sub-total: Operations	8,155	844	671	1	1,207	1,334	170	142,704	3,955	1	253,764	230,211
Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Federal CBNG Wells - Sub-total: Reclamation	13	1	<1	<1	<1	<1	<1	16	<1	<1	16	15
<b>Federal CBNG Wells - Total Emissions</b>	<b>8,185</b>	<b>848</b>	<b>683</b>	<b>1</b>	<b>1,212</b>	<b>1,335</b>	<b>170</b>	<b>144,450</b>	<b>3,956</b>	<b>1</b>	<b>255,521</b>	<b>231,805</b>
Non-Federal CBNG Wells - Sub-total: Construction	9	1	7	<1	3	1	<1	988	<1	<1	994	902
Non-Federal CBNG Wells - Sub-total: Operations	4,578	474	377	<1	678	749	96	80,115	2,221	1	142,464	129,241
Non-Federal CBNG Wells - Sub-total: Maintenance	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Non-Federal CBNG Wells - Sub-total: Reclamation	7	1	<1	<1	<1	<1	<1	9	<1	<1	9	8
<b>Non-Federal CBNG Wells - Total Emissions</b>	<b>4,595</b>	<b>476</b>	<b>384</b>	<b>&lt;1</b>	<b>680</b>	<b>749</b>	<b>96</b>	<b>81,112</b>	<b>2,221</b>	<b>1</b>	<b>143,468</b>	<b>130,152</b>
Federal Sand and Gravel - Extraction and Processing Sub-total:	251	26	2	<1	1	<1	<1	215	<1	<1	216	196
Federal Sand and Gravel - Travel and Reclamation Sub-total:	7	<1	<1	<1	<1	<1	<1	32	<1	<1	32	29
<b>Federal Sand and Gravel - Total Emissions</b>	<b>258</b>	<b>26</b>	<b>2</b>	<b>&lt;1</b>	<b>1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>247</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>248</b>	<b>225</b>
Federal Coal Mining - Sub-total: Extraction and Processing	6,989	931	2,244	5	1,419	371	37	251,580	5	2	252,250	228,902
Federal Coal Mining - Sub-total: Travel and Reclamation	125	14	14	<1	9	2	<1	1,645	<1	<1	1,649	1,497
<b>Federal Coal Mining - Total Emissions</b>	<b>7,114</b>	<b>945</b>	<b>2,258</b>	<b>5</b>	<b>1,428</b>	<b>374</b>	<b>37</b>	<b>253,225</b>	<b>5</b>	<b>2</b>	<b>253,899</b>	<b>230,334</b>



Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
<b>Federal Fire Management and Ecology - Total Emissions</b>	<b>1,203</b>	<b>945</b>	<b>343</b>	<b>83</b>	<b>10,816</b>	<b>557</b>	<b>56</b>	<b>11,340</b>	<b>572</b>	<b>83</b>	<b>49,372</b>	<b>44,790</b>
Federal Land Resources (ROW and RE) - Sub-total: Heavy Equipment	82	14	55	<1	31	9	1	6,556	<1	<1	6,573	5,963
Federal Land Resources (ROW and RE) - Sub-total: Commuting Vehicles	6	1	1	<1	1	<1	<1	207	<1	<1	208	189
<b>Federal Land Resources (ROW and RE) - Total Emissions</b>	<b>87</b>	<b>15</b>	<b>56</b>	<b>&lt;1</b>	<b>32</b>	<b>9</b>	<b>1</b>	<b>6,763</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>6,781</b>	<b>6,151</b>
Federal Livestock Grazing - Sub-total: Heavy Equipment	26	3	2	<1	1	<1	<1	216	<1	<1	216	196
Federal Livestock Grazing - Sub-total: Commuting Vehicles	38	4	8	<1	2	<1	<1	1,482	11,216	<1	315,535	286,248
<b>Federal Livestock Grazing - Total Emissions</b>	<b>64</b>	<b>7</b>	<b>9</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>1,698</b>	<b>11,216</b>	<b>&lt;1</b>	<b>315,751</b>	<b>286,444</b>
<b>Federal Trails and Roads -Total Emissions</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>496</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>497</b>	<b>451</b>
Federal Vegetation Management - Sub-total: Heavy Equipment	21	2	<1	<1	<1	<1	<1	35	<1	<1	35	32
Federal Vegetation Management - Sub-total: Commuting Vehicles	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<b>Federal Vegetation Management - Total Emissions</b>	<b>21</b>	<b>2</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>35</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>35</b>	<b>32</b>
<b>Federal BLM General Purpose Travel - Total Emissions</b>	<b>28</b>	<b>3</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>2</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>150</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>151</b>	<b>137</b>

**Table P-14. Alternative D—Long-year Air Emissions Summary, Total Annual Emissions, All Project Resources (Tons)**

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Federal Oil Wells - Sub-total: Construction	122	15	65	<1	16	4	<1	8,082	1	<1	8,117	7,364
Federal Oil Wells - Sub-total: Operations	828	132	13,820	3	7,213	1,593	111	630,873	2,790	7	710,739	644,772
Federal Oil Wells - Sub-total: Maintenance	619	87	309	1	195	51	5	34,611	1	<1	34,703	31,482
Federal Oil Wells - Sub-total: Reclamation	3	<1	1	<1	1	<1	<1	98	<1	<1	98	89
<b>Federal Oil Wells - Total Emissions</b>	<b>1,572</b>	<b>235</b>	<b>14,195</b>	<b>4</b>	<b>7,425</b>	<b>1,649</b>	<b>117</b>	<b>673,663</b>	<b>2,791</b>	<b>7</b>	<b>753,657</b>	<b>683,706</b>
Non-Federal Oil Wells - Sub-total: Construction	26	3	14	<1	4	1	<1	1,757	<1	<1	1,779	1,614
Non-Federal Oil Wells - Sub-total: Operations	253	40	4,219	1	2,202	486	34	192,582	852	2	216,963	196,825
Non-Federal Oil Wells - Sub-total: Maintenance	189	27	94	<1	60	16	2	10,565	<1	<1	10,593	9,610
Non-Federal Oil Wells - Sub-total: Reclamation	1	<1	<1	<1	<1	<1	<1	30	<1	<1	30	27
<b>Non-Federal Oil Wells - Total Emissions</b>	<b>469</b>	<b>70</b>	<b>4,327</b>	<b>1</b>	<b>2,265</b>	<b>503</b>	<b>36</b>	<b>204,934</b>	<b>852</b>	<b>2</b>	<b>229,365</b>	<b>208,076</b>
Federal Natural Gas Wells - Sub-total: Construction	3,312	459	1,136	3	299	88	8	163,784	50	2	165,578	150,210
Federal Natural Gas Wells - Sub-total: Operations	11,750	1,476	5,987	16	8,694	67,902	2,266	3,000,852	35,066	45	3,994,705	3,623,937
Federal Natural Gas Wells - Sub-total: Maintenance	290	41	145	<1	91	24	2	16,216	<1	<1	16,259	14,750
Federal Natural Gas Wells - Sub-total: Reclamation	17	2	4	<1	2	1	<1	433	<1	<1	434	394
<b>Federal Natural Gas Wells - Total Emissions</b>	<b>15,369</b>	<b>1,978</b>	<b>7,272</b>	<b>19</b>	<b>9,087</b>	<b>68,015</b>	<b>2,276</b>	<b>3,181,285</b>	<b>35,115</b>	<b>47</b>	<b>4,176,977</b>	<b>3,789,291</b>
Non-Federal Natural Gas Wells - Sub-total: Construction	784	109	269	1	71	21	2	38,770	12	1	39,470	35,807

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Non-Federal Natural Gas Wells - Sub-total: Operations	3,580	450	1,824	5	2,649	20,690	690	914,358	10,685	14	1,217,189	1,104,216
Non-Federal Natural Gas Wells - Sub-total: Maintenance	88	12	44	<1	28	7	1	4,941	<1	<1	4,954	4,494
Non-Federal Natural Gas Wells - Sub-total: Reclamation	5	1	1	<1	1	<1	<1	132	<1	<1	132	120
<b>Non-Federal Natural Gas Wells - Total Emissions</b>	<b>4,458</b>	<b>571</b>	<b>2,138</b>	<b>6</b>	<b>2,749</b>	<b>20,718</b>	<b>693</b>	<b>958,201</b>	<b>10,696</b>	<b>15</b>	<b>1,261,746</b>	<b>1,144,637</b>
Federal CBNG Wells - Sub-total: Construction	16	2	12	<1	5	1	<1	1,730	<1	<1	1,740	1,579
Federal CBNG Wells - Sub-total: Operations	7,654	792	630	1	1,133	1,252	160	133,942	3,712	1	238,182	216,075
Federal CBNG Wells - Sub-total: Maintenance	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Federal CBNG Wells - Sub-total: Reclamation	13	1	<1	<1	<1	<1	<1	16	<1	<1	16	14
<b>Federal CBNG Wells - Total Emissions</b>	<b>7,684</b>	<b>796</b>	<b>642</b>	<b>1</b>	<b>1,138</b>	<b>1,253</b>	<b>160</b>	<b>135,687</b>	<b>3,713</b>	<b>1</b>	<b>239,939</b>	<b>217,669</b>
Non-Federal CBNG Wells - Sub-total: Construction	9	1	7	<1	3	1	<1	988	<1	<1	994	902
Non-Federal CBNG Wells - Sub-total: Operations	4,578	474	377	<1	678	749	96	80,115	2,221	1	142,464	129,241
Non-Federal CBNG Wells - Sub-total: Maintenance	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Non-Federal CBNG Wells - Sub-total: Reclamation	8	1	<1	<1	<1	<1	<1	10	<1	<1	10	9
<b>Non-Federal CBNG Wells - Total Emissions</b>	<b>4,595</b>	<b>476</b>	<b>384</b>	<b>&lt;1</b>	<b>680</b>	<b>750</b>	<b>96</b>	<b>81,113</b>	<b>2,221</b>	<b>1</b>	<b>143,468</b>	<b>130,152</b>
Federal Sand and Gravel - Extraction and Processing Sub-total:	251	26	2	<1	1	<1	<1	215	<1	<1	216	196

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Federal Sand and Gravel - Travel and Reclamation Sub-total:	7	<1	<1	<1	<1	<1	<1	32	<1	<1	32	29
<b>Federal Sand and Gravel - Total Emissions</b>	<b>258</b>	<b>26</b>	<b>2</b>	<b>&lt;1</b>	<b>1</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>247</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>248</b>	<b>225</b>
Federal Coal Mining - Sub-total: Extraction and Processing	6,989	931	2,244	5	1,419	371	37	251,580	5	2	252,250	228,837
Federal Coal Mining - Sub-total: Travel and Reclamation	125	14	14	<1	9	2	<1	1,645	<1	<1	1,649	1,496
<b>Federal Coal Mining - Total Emissions</b>	<b>7,114</b>	<b>945</b>	<b>2,258</b>	<b>5</b>	<b>1,428</b>	<b>374</b>	<b>37</b>	<b>253,225</b>	<b>5</b>	<b>2</b>	<b>253,899</b>	<b>230,334</b>
<b>Federal Fire Management and Ecology - Total Emissions</b>	<b>274</b>	<b>194</b>	<b>85</b>	<b>17</b>	<b>2,174</b>	<b>114</b>	<b>11</b>	<b>9,172</b>	<b>115</b>	<b>17</b>	<b>16,845</b>	<b>15,281</b>
Federal Land Resources (ROW and RE) - Sub-total: Heavy Equipment	59	10	43	<1	24	7	1	5,079	<1	<1	5,093	4,620
Federal Land Resources (ROW and RE) - Sub-total: Commuting Vehicles	4	<1	<1	<1	1	<1	<1	114	<1	<1	114	103
<b>Federal Land Resources (ROW and RE) - Total Emissions</b>	<b>62</b>	<b>11</b>	<b>43</b>	<b>&lt;1</b>	<b>25</b>	<b>7</b>	<b>1</b>	<b>5,193</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>5,207</b>	<b>4,724</b>
Federal Livestock Grazing - Sub-total: Heavy Equipment	26	3	2	<1	1	<1	<1	216	<1	<1	216	196
Federal Livestock Grazing - Sub-total: Commuting Vehicles	38	4	8	<1	2	<1	<1	1,482	11,216	<1	315,535	286,248
<b>Federal Livestock Grazing - Total Emissions</b>	<b>64</b>	<b>7</b>	<b>9</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>1,698</b>	<b>11,216</b>	<b>&lt;1</b>	<b>315,751</b>	<b>286,444</b>
<b>Federal Trails and Roads -Total Emissions</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>&lt;1</b>	<b>3</b>	<b>1</b>	<b>&lt;1</b>	<b>496</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>497</b>	<b>451</b>
Federal Vegetation Management - Sub-total: Heavy Equipment	21	2	<1	<1	<1	<1	<1	35	<1	<1	35	32
Federal Vegetation Management - Sub-total: Commuting Vehicles	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Activity	Criteria Pollutants					Organics		Greenhouse Gases				CO <sub>2eq</sub> metric tonnes
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2eq</sub>	
Federal Vegetation Management - Total Emissions	21	2	<1	<1	<1	<1	<1	35	<1	<1	35	32
Federal BLM General Purpose Travel - Total Emissions	28	3	<1	<1	2	<1	<1	150	<1	<1	151	137

**Table P-15. Trona Mining Activities, Annual Emissions Summary (Tons)**

Activity	Criteria Pollutants					Organics		Greenhouse Gases	
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	HAPs <sup>a</sup>	CO <sub>2eq</sub> tons	CO <sub>2eq</sub> metric tonnes
Mobile Source Emissions	50	50**	1,047	1	462	84	8	94,646	85,870
Trona Mine Operation Activities	664	455	466	4	1,666	415	41	850,045	771,148
<b>Total</b>	<b>713</b>	<b>505</b>	<b>1,513</b>	<b>5</b>	<b>2,129</b>	<b>499</b>	<b>50</b>	<b>944,701</b>	<b>857,018</b>

<sup>a</sup> HAPs = Hazardous Air Pollutants; assumed = VOCs \* <1.1

\*\*PM<sub>2.5</sub> was calculated at the same emissions rate as PM<sub>10</sub> for Locomotives to have consistency with the BLM's Excel spreadsheet-based emissions calculators. Typically, PM<sub>2.5</sub> would be a percentage of PM<sub>10</sub>.

**Table P-16. General Overall Inputs for Oil Production – Alternative A**

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Maximum Number of Wells Drilled Annually - Federal	23.0	23.0	23.0
Maximum Number of Wells Drilled Annually - Non-Federal	5.0	5.0	5.0
Average Number of Wells per Well Pad - Federal	1.0	1.0	1.0
Average Number of Wells per Well Pad - Non-Federal	1.0	1.0	1.0

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Maximum Number of Wells Producing Annually - Federal	171.0	316.0	478.0
Maximum Number of Wells Producing Annually - Non-Federal	76.0	108.0	144.0
Average Number of Field Compressor Stations Developed Annually - Federal	2.0	2.0	2.0
Average Number of Field Compressor Stations Developed Annually - Non-Federal	1.0	1.0	1.0
Average Number of Sales Compressor Stations Developed Annually - Federal	0.0	0.0	0.0
Average Number of Sales Compressor Stations Developed Annually - Non-Federal	1.0	1.0	1.0
Average Barrels of Oil Production per Well per Day - Federal	16	44.0	44.0
Average Barrels of Oil Production per Well per Day - Non-Federal	16	44.0	44.0
Average Gas Production per Well per Day -Federal (thousand standard cubic feet [MSCF]/day)	8.0	22.0	22.0
Average Gas Production per Well per Day - Non-Federal (MSCF/day)	8.0	22.0	22.0

**Table P-17. General Overall Inputs for Oil Production – Alternative B**

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Maximum Number of Wells Drilled Annually - Federal	6.0	6.0	6.0
Maximum Number of Wells Drilled Annually - Non-Federal	5.0	5.0	5.0
Average Number of Wells per Well Pad - Federal	1.0	1.0	1.0
Average Number of Wells per Well Pad - Non-Federal	1.0	1.0	1.0
Maximum Number of Wells Producing Annually - Federal	158.0	188.0	222.0
Maximum Number of Wells Producing Annually - Non-Federal	76.0	108.0	144.0
Average Number of Field Compressor Stations Developed Annually - Federal	2.0	2.0	2.0
Average Number of Field Compressor Stations Developed Annually - Non-Federal	1.0	1.0	1.0

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Average Number of Sales Compressor Stations Developed Annually - Federal	0.0	0.0	0.0
Average Number of Sales Compressor Stations Developed Annually - Non-Federal	1.0	1.0	1.0
Average Barrels of Oil Production per Well per Day - Federal	16	44.0	44.0
Average Barrels of Oil Production per Well per Day - Non-Federal	16	44.0	44.0
Average Gas Production per Well per Day -Federal (MSCF/day)	8.0	22.0	22.0
Average Gas Production per Well per Day - Non-Federal (MSCF/day)	8.0	22.0	22.0

**Table P-18. General Overall Inputs for Oil Production – Alternative C**

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Maximum Number of Wells Drilled Annually - Federal	24.0	24.0	24.0
Maximum Number of Wells Drilled Annually - Non-Federal	5.0	5.0	5.0
Average Number of Wells per Well Pad - Federal	1.0	1.0	1.0
Average Number of Wells per Well Pad - Non-Federal	1.0	1.0	1.0
Maximum Number of Wells Producing Annually - Federal	172.0	321.0	488.0
Maximum Number of Wells Producing Annually - Non-Federal	76.0	108.0	145.0
Average Number of Field Compressor Stations Developed Annually - Federal	2.0	2.0	2.0
Average Number of Field Compressor Stations Developed Annually - Non-Federal	1.0	1.0	1.0
Average Number of Sales Compressor Stations Developed Annually - Federal	0.0	0.0	0.0
Average Number of Sales Compressor Stations Developed Annually - Non-Federal	1.0	1.0	1.0
Average Barrels of Oil Production per Well per Day - Federal	16	44.0	44.0
Average Barrels of Oil Production per Well per Day - Non-Federal	16	44.0	44.0
Average Gas Production per Well per Day -Federal (MSCF/day)	8.0	22.0	22.0

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Average Gas Production per Well per Day - Non-Federal (MSCF/day)	8.0	22.0	22.0

**Table P-19. General Overall Inputs for Oil Production – Alternative D**

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Maximum Number of Wells Drilled Annually - Federal	23.0	23.0	23.0
Maximum Number of Wells Drilled Annually - Non-Federal	5.0	5.0	5.0
Average Number of Wells per Well Pad - Federal	1.0	1.0	1.0
Average Number of Wells per Well Pad - Non-Federal	1.0	1.0	1.0
Maximum Number of Wells Producing Annually - Federal	171.0	314.0	475.0
Maximum Number of Wells Producing Annually - Non-Federal	76.0	108.0	145.0
Average Number of Field Compressor Stations Developed Annually - Federal	2.0	2.0	2.0
Average Number of Field Compressor Stations Developed Annually - Non-Federal	1.0	1.0	1.0
Average Number of Sales Compressor Stations Developed Annually - Federal	0.0	0.0	0.0
Average Number of Sales Compressor Stations Developed Annually - Non-Federal	1.0	1.0	1.0
Average Barrels of Oil Production per Well per Day - Federal	16	44.0	44.0
Average Barrels of Oil Production per Well per Day - Non-Federal	16	44.0	44.0
Average Gas Production per Well per Day -Federal (MSCF/day)	8.0	22.0	22.0
Average Gas Production per Well per Day - Non-Federal (MSCF/day)	8.0	22.0	22.0

**Table P-20. General Overall Inputs for Natural Gas Production – Alternative A**

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Maximum Number of Wells Drilled Annually - Federal	209.0	209.0	209.0



	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Maximum Number of Wells Drilled Annually - Non-Federal	49.0	49.0	49.0
Average Number of Wells per Well Pad - Federal	2.0	3.0	3.0
Average Number of Wells per Well Pad - Non-Federal	2.0	3.0	3.0
Maximum Number of Wells Producing Annually - Federal	1,539.0	2,843.0	4,304.0
Maximum Number of Wells Producing Annually - Non-Federal	687.0	973.0	1,294.0
Average Number of Field Compressor Stations Developed Annually - Federal	7.0	7.0	7.0
Average Number of Field Compressor Stations Developed Annually - Non-Federal	2.0	2.0	2.0
Average Number of Sales Compressor Stations Developed Annually - Federal	1.0	1.0	1.0
Average Number of Sales Compressor Stations Developed Annually - Non-Federal	1.0	1.0	1.0
Average Gas Production per Well per Day - Federal (MSCF/day)	74.0	198.0	198.0
Average Gas Production per Well per Day - Non-Federal (MSCF/day)	74.0	198.0	198.0

**Table P-21. General Overall Inputs for Natural Gas Production – Alternative B**

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Maximum Number of Wells Drilled Annually - Federal	55.0	55.0	55.0
Maximum Number of Wells Drilled Annually - Non-Federal	49.0	49.0	49.0
Average Number of Wells per Well Pad - Federal	2.0	3.0	3.0
Average Number of Wells per Well Pad - Non-Federal	2.0	3.0	3.0
Maximum Number of Wells Producing Annually - Federal	1,424.0	1,690.0	1,997.0
Maximum Number of Wells Producing Annually - Non-Federal	687.0	972.0	1,293.0
Average Number of Field Compressor Stations Developed Annually - Federal	1.0	1.0	1.0

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Average Number of Field Compressor Stations Developed Annually - Non-Federal	1.0	1.0	1.0
Average Number of Sales Compressor Stations Developed Annually - Federal	0.0	0.0	0.0
Average Number of Sales Compressor Stations Developed Annually - Non-Federal	0.0	0.0	0.0
Average Gas Production per Well per Day - Federal (MSCF/day)	74.0	198.0	198.0
Average Gas Production per Well per Day - Non-Federal (MSCF/day)	74.0	198.0	198.0

**Table P-22. General Overall Inputs for Natural Gas Production – Alternative C**

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Maximum Number of Wells Drilled Annually - Federal	215.0	215.0	215.0
Maximum Number of Wells Drilled Annually - Non-Federal	49.0	49.0	49.0
Average Number of Wells per Well Pad - Federal	2.0	3.0	3.0
Average Number of Wells per Well Pad - Non-Federal	2.0	3.0	3.0
Maximum Number of Wells Producing Annually - Federal	1,544.0	2,886.0	4,390.0
Maximum Number of Wells Producing Annually - Non-Federal	688.0	976.0	1,302.0
Average Number of Field Compressor Stations Developed Annually - Federal	7.0	7.0	7.0
Average Number of Field Compressor Stations Developed Annually - Non-Federal	2.0	2.0	2.0
Average Number of Sales Compressor Stations Developed Annually - Federal	1.0	1.0	1.0
Average Number of Sales Compressor Stations Developed Annually - Non-Federal	1.0	1.0	1.0
Average Gas Production per Well per Day - Federal (MSCF/day)	74.0	198.0	198.0
Average Gas Production per Well per Day - Non-Federal (MSCF/day)	74.0	198.0	198.0

**Table P-23. General Overall Inputs for Natural Gas Production – Alternative D**

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Maximum Number of Wells Drilled Annually - Federal	207.0	207.0	207.0
Maximum Number of Wells Drilled Annually - Non-Federal	49.0	49.0	49.0
Average Number of Wells per Well Pad - Federal	2.0	3.0	3.0
Average Number of Wells per Well Pad - Non-Federal	2.0	3.0	3.0
Maximum Number of Wells Producing Annually - Federal	1,538.0	2,828.0	4,273.0
Maximum Number of Wells Producing Annually - Non-Federal	688.0	976.0	1,302.0
Average Number of Field Compressor Stations Developed Annually - Federal	7.0	7.0	7.0
Average Number of Field Compressor Stations Developed Annually - Non-Federal	2.0	2.0	2.0
Average Number of Sales Compressor Stations Developed Annually - Federal	1.0	1.0	1.0
Average Number of Sales Compressor Stations Developed Annually - Non-Federal	1.0	1.0	1.0
Average Gas Production per Well per Day - Federal (MSCF/day)	74.0	198.0	198.0
Average Gas Production per Well per Day - Non-Federal (MSCF/day)	74.0	198.0	198.0

**Table P-24. General Overall Inputs for Coalbed Natural Gas Production – Alternative A**

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Maximum Number of Wells Drilled Annually - Federal	6.0	6.0	6.0
Maximum Number of Wells Drilled Annually - Non-Federal	4.0	4.0	4.0
Average Number of Wells per Well Pad - Federal	1.0	1.0	1.0
Average Number of Wells per Well Pad - Non-Federal	1.0	1.0	1.0
Maximum Number of Wells Producing Annually - Federal	33.0	68.0	100.0
Maximum Number of Wells Producing Annually - Non-Federal	27.0	34.0	59.0
Average Number of Field Compressor Stations Developed Annually - Federal	2.0	2.0	2.0

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Average Number of Field Compressor Stations Developed Annually - Non-Federal	1.0	1.0	1.0
Average Number of Sales Compressor Stations Developed Annually - Federal	0.0	0.0	0.0
Average Number of Sales Compressor Stations Developed Annually - Non-Federal	0.0	0.0	0.0
Average Gas Production per Well per Day - Federal (MSCF/day)	2.0	20.0	20.0
Average Gas Production per Well per Day - Non-Federal (MSCF/day)	2.0	20.0	20.0

**Table P-25. General Overall Inputs for Coalbed Natural Gas Production – Alternative B**

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Maximum Number of Wells Drilled Annually - Federal	3.0	3.0	3.0
Maximum Number of Wells Drilled Annually - Non-Federal	4.0	4.0	4.0
Average Number of Wells per Well Pad - Federal	1.0	1.0	1.0
Average Number of Wells per Well Pad - Non-Federal	1.0	1.0	1.0
Maximum Number of Wells Producing Annually - Federal	30.0	42.0	49.0
Maximum Number of Wells Producing Annually - Non-Federal	27.0	33.0	58.0
Average Number of Field Compressor Stations Developed Annually - Federal	1.0	1.0	1.0
Average Number of Field Compressor Stations Developed Annually - Non-Federal	1.0	1.0	1.0
Average Number of Sales Compressor Stations Developed Annually - Federal	0.0	0.0	0.0
Average Number of Sales Compressor Stations Developed Annually - Non-Federal	0.0	0.0	0.0
Average Gas Production per Well per Day - Federal (MSCF/day)	1.0	20.0	20.0
Average Gas Production per Well per Day - Non-Federal (MSCF/day)	1.0	20.0	20.0

**Table P-26. General Overall Inputs for Coalbed Natural Gas Production – Alternative C**

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Maximum Number of Wells Drilled Annually - Federal	7.0	7.0	7.0
Maximum Number of Wells Drilled Annually - Non-Federal	4.0	4.0	4.0
Average Number of Wells per Well Pad - Federal	1.0	1.0	1.0
Average Number of Wells per Well Pad - Non-Federal	1.0	1.0	1.0
Maximum Number of Wells Producing Annually - Federal	34.0	75.0	114.0
Maximum Number of Wells Producing Annually - Non-Federal	27.0	36.0	64.0
Average Number of Field Compressor Stations Developed Annually - Federal	2.0	2.0	2.0
Average Number of Field Compressor Stations Developed Annually - Non-Federal	1.0	1.0	1.0
Average Number of Sales Compressor Stations Developed Annually - Federal	0.0	0.0	0.0
Average Number of Sales Compressor Stations Developed Annually - Non-Federal	0.0	0.0	0.0
Average Gas Production per Well per Day - Federal (MSCF/day)	2.0	20.0	20.0
Average Gas Production per Well per Day - Non-Federal (MSCF/day)	2.0	20.0	20.0

**Table P-27. General Overall Inputs for Coalbed Natural Gas Production – Alternative D**

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Maximum Number of Wells Drilled Annually - Federal	7.0	7.0	7.0
Maximum Number of Wells Drilled Annually - Non-Federal	4.0	4.0	4.0
Average Number of Wells per Well Pad - Federal	1.0	1.0	1.0
Average Number of Wells per Well Pad - Non-Federal	1.0	1.0	1.0
Maximum Number of Wells Producing Annually - Federal	33.0	72.0	107.0
Maximum Number of Wells Producing Annually - Non-Federal	27.0	36.0	64.0
Average Number of Field Compressor Stations Developed Annually - Federal	2.0	2.0	2.0
Average Number of Field Compressor Stations Developed Annually - Non-Federal	1.0	1.0	1.0
Average Number of Sales Compressor Stations Developed Annually - Federal	0.0	0.0	0.0

	Short Year (Year 1)	Mid-Year (Year 10)	Long Year (Year 20)
Average Number of Sales Compressor Stations Developed Annually - Non-Federal	0.0	0.0	0.0
Average Gas Production per Well per Day - Federal (MSCF/day)	2.0	20.0	20.0
Average Gas Production per Well per Day - Non-Federal (MSCF/day)	1.0	20.0	20.0

**Table P-28. General Overall Inputs for Non-Oil and Gas Development within the Planning Area for All Alternatives, Year 1, Year 10 and Year 20**

Key Assumptions	Alternative A	Alternative B	Alternative C	Alternative D
<b>Sand and Gravel</b>				
Total Annual Tons of Mined Material Processed	5,111.0	4,000.0	6,500.0	5,111.0
Percentage of Total Mined Material Processed at Facilities (%)	25.0	20.0	30.0	25.0
All Operations - Annual Development (acres)	5.0	5.0	5.0	5.0
All Operations - Reclamation (acres)	2.0	2.0	2.0	2.0
Annual Disturbed Area for Wind Erosion Calculations (acres)	372.5	372.5	372.5	372.5
<b>Coal Mining and Usage</b>				
Total Annual Tons of Mined Material Processed	8,800,000.0	8,800,000.0	8,800,000.0	8,800,000.0
All Operations - Annual Development (acres)	135.0	135.0	135.0	135.0
All Operations - Reclamation (acres)	150.0	150.0	150.0	150.0
Annual Disturbed Area for Wind Erosion Calculations (acres)	1,000.0	1,000.0	1,000.0	1,000.0
<b>Trona Mining</b>				
Total Annual Tons of Trona Produced per year (16% of the annual Mined Trona in the Known Sodium Leasing Area)	2,641,105.0	2,641,105.0	2,641,105.0	2,641,105.0
<b>Fire Management and Ecology</b>				
Maximum Number of Mechanical Treatments per Year	5.0	1.0	8.0	5.0
Maximum Number of Prescribed Fires per Year	4.0	0.0	6.0	4.0
Maximum Number of Wildfires per Year	60.0	0.0	100.0	60.0
Maximum Number of Underground Coal Seam Fires per Year	0.0	0.0	0.0	0.0
Total Annual Area for Mechanical Treatments (acres)	150.0	30.0	3000.0	150.0

<b>Key Assumptions</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
Total Annual Area for Prescribed Fire (acres)	400.0	0.0	2000.0	400.0
Total Annual Area for Wildfire (acres)	2,000.0	0.0	10,000.0	2,000.0
Total Annual Area for Underground Coal Seam Fire (acres)	170.0	0.0	350.0	170.0
<b>Land Resources (ROW and RE)</b>				
Number of Wind Energy Projects per Year	1.0	2.0	1.0	1.0
Average Number of Turbines per Wind Energy Project	80.0	80.0	180.0	80.0
Number of Non - (Oil and Gas or Uranium Mining) Pipelines Developed per Year	5.0	5.0	15.0	5.0
Number of Non - (Oil and Gas or Mining or Fire Management) Resource Roads Developed per Year	10.0	5.0	20.0	10.0
Number of Communication Sites Developed per Year	3.0	2.0	5.0	3.0
Number of Power Lines Developed per Year	8.0	5.0	11.0	8.0
Number of Telecommunication and Fiber Optics Lines Developed per Year	5.0	2.0	10.0	5.0
Average Overall Disturbed Area per Wind Energy Project (acres)	5,200.0	2,200.0	5,200.0	5,200.0
Average Overall Disturbed Area per Developed Non - (Oil and Gas or Uranium Mining) Pipeline (acres)	10.0	10.0	20.0	10.0
Average Disturbed Road Length per Developed Non - (Oil and Gas or Mining or Fire Management) Roads (miles)	4.0	5.0	10.0	4.0
Average Disturbed Area per Communication Site (acres)	4.0	5.0	10.0	4.0
Average Overall Disturbed Area per Developed Power Line (acres)	40.0	30.0	60.0	40.0
Average Disturbed Area per Developed Telecommunication and Fiber Optic Line (acres)	25.0	10.0	40.0	25.0
<b>Livestock Grazing</b>				
Total Disturbed Acreage per Year - Springs	1.0	0.0	4.0	1.0
Total Disturbed Acreage per Year - Reservoirs / Pits	4.0	2.0	8.0	4.0
Total Disturbed Acreage per Year - Wells	1.0	0.0	4.0	1.0
Total Disturbed Acreage per Year - Pipelines	1.0	0.0	4.0	1.0
Total Disturbed Acreage per Year - Fences	1.0	0.0	5.0	1.0

Key Assumptions	Alternative A	Alternative B	Alternative C	Alternative D
Total Disturbed Acreage per Year - Reservoirs Maintenance	4.0	2.0	8.0	4.0
Total miles of Fence Line per Fences Project	5.0	4.0	8.0	5.0
Total Permitted Head of Cattle	164,385.0	32,525.0	164,385.0	164,385.0
Total Permitted Head of Horses	454.0	454.0	454.0	454.0
Total Permitted Head of Buffalo	0.0	0.0	0.0	0.0
Total Permitted Head of Sheep	135,853.0	135,853.0	135,853.0	135,853.0
<b>Trails and Roads</b>				
Average Miles of Maintained Road per Road Maintenance Project - Summer	18.0	18.0	18.0	18.0
Average Miles of Maintained Road per Road Maintenance Project - Winter	0.0	0.0	0.0	0.0
Average Number of Road Maintenance Projects per Period - Summer	80.0	80.0	80.0	80.0
Average Number of Road Maintenance Projects per Period - Winter	0.0	0.0	0.0	0.0
<b>Vegetation Management</b>				
Total Acres per Year - Forest/Woodland Silviculture	0.0	0.0	0.0	0.0
Total Acres per Year - Forest/Woodland Forest Products	2.0	10.0	5.0	5.0
Total Acres per Year - Forest/Woodland Weed Treatment	500.0	2,000.0	1,500.0	1,500.0
Total Acres per Year - Forest/Woodland Insect Control	0.0	0.0	0.0	0.0

**Table P-29. Downstream Greenhouse Gas Calculation Assumptions for Alternative C (Least Restrictive)**

<b>Coal Combustion</b>								
GHG	Coal Combusted (tons/yr)	Heat Content of Bridger Mine Coal* (MMBTU/ton)	Emission Factor **	Unit	Emissions (kg/yr)	Emissions (short tons/yr)	Emissions (metric tonnes/yr)	CO <sub>2eq</sub> Emissions (million metric tons)
CO <sub>2</sub>	8,800,000	18.4	97.17	kg/MMBTU	15,733,766,400	17,343,331	15,733,766	15.73
CH <sub>4</sub>	8,800,000	18.4	11	gr/MMBTU	1,781,120	1,963	1,781	<1
N <sub>2</sub> O	8,800,000	18.4	1.6	gr/MMBTU	259,072	286	259	<1



Total								15.85
Oil Combustion								
GHG	Number of Producing Wells Long Term	Average Production Rate	Unit	HHV	Combustion Emission Factor (g/MMBTU)	Emissions (short tons/yr)	Emissions (metric tonnes/yr)	CO <sub>2eq</sub> Emissions (million metric tons)
CO <sub>2</sub>	488	44	barrels/day	5.8	74,000	3,707,873	3,363,412	3.36
CH <sub>4</sub>	488	44	barrels/day	5.8	10	501	455	<1
N <sub>2</sub> O	488	44	barrels/day	5.8	0.6	30	27	<1
Total								3.38
Natural Gas Combustion								
GHG	Number of Producing Wells Long Term	Average Production Rate	Unit	HHV***	Combustion Emission Factor (g/MMBTU)	Emissions (short tons/yr)	Emissions (metric tonnes/yr)	CO <sub>2eq</sub> Emissions (million metric tons)
CO <sub>2</sub>	4,390	198	MSCF/day	1.037	53,060	19,242,805	17,455,149	17.46
CH <sub>4</sub>	4,390	198	MSCF/day	1.037	1	363	329	<1
N <sub>2</sub> O	4,390	198	MSCF/day	1.037	0.1	36	33	<1
Total								17.47

\* from Environmental Assessment for Jim Bridger Coal Mine Complex Mining Plan Modification for Federal Coal Lease WYW-02727, OSMRE, Aug. 2017; MMBTU=one million British Thermal Units

\*\* [https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors\\_2014.pdf](https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf)

\*\*\* Assume HHV for natural gas = 1037 BTU/scf (1.037 MMBTU/Mscf) and oil = 5.8 MMBTU/barrel

**Table P-30. EPA’s Facility Level Information on Greenhouse Gases Tool (FLIGHT) Reported Emissions for Sweetwater County Wyoming in 2016**

Facility Name	GHGRP* ID	Latitude	Longitude	City Name	County Name	State	Zip Code	Parent Companies	GHG Quantity (Metric Tons CO <sub>2e</sub> )	Subparts
Echo Springs Compressor Station	1,003,142	41.718603	-107.787979	Sweetwater County	Sweetwater	WY	82,301	Rockies express Holdings LLC (50%); P66REX LLC (25%); TEP REX Holdings, LLC (25%)	27,482	C,W

Facility Name	GHGRP* ID	Latitude	Longitude	City Name	County Name	State	Zip Code	Parent Companies	GHG Quantity (Metric Tons CO <sub>2e</sub> )	Subparts
Frewen Lake Compressor Station	1,002,238	41.6709	-108.035	Sweetwater County	Sweetwater	WY	82,336	Williams Partners, LP (100%)	0	-

Data Extracted from EPA's FLIGHT Tool (<http://ghgdata.epa.gov/ghgp>)

The data was reported to EPA by facilities as of 08/05/2017

All emissions data is presented in units of metric tons of carbon dioxide equivalent using Global Warming Potentials from Intergovernmental Panel on Climate Change's AR4

Search Parameters: year=2016; state=WY; GHGs=ALL; data type=All Emitters

\* Greenhouse Gas Reporting Program

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# APPENDIX Q—AIR QUALITY ADAPTIVE MANAGEMENT STRATEGY

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## Q.1 PURPOSE

The Rock Springs Field Office Air Quality Adaptive Management Strategy (AQAMS) is intended to present the processes, procedures, and actions that support adaptive management principles for the protection of air resources and atmospheric values within the Rock Springs planning area. This AQAMS describes air resources management and outlines specific requirements for proponents of projects that have the potential to generate air emissions and impact air resources.

### Q.1.1 Nexus with the Resource Management Plan

The basis for development and inclusion of this AQAMS is supported by the specific goals and objectives outlined in Chapter 2 of the Rock Springs Resource Management Plan (RMP), specifically:

- **Management Goal PR 01:** Minimize the impact of management actions in the Planning Area on air quality by complying with all applicable air quality laws, rules, and regulations.
- **Management Goal PR 02:** Improve air quality in the Planning Area as practicable.
- **Management Objective PR 1-1:** Maintain concentrations of criteria pollutants in compliance with applicable state and federal Ambient Air Quality Standards within the scope of the Bureau of Land Management's (BLM) authority.
- **Management Objective 1-2:** Maintain concentrations of prevention of significant deterioration (PSD) pollutants associated with management actions in compliance with the applicable increment.
- **Management Objective 2.1:** Reduce visibility-impairing pollutants in accordance with the reasonable progress goals and time-frames established within the State of Wyoming's Regional Haze State Implementation Plan.
- **Management Objective 2.2:** Reduce atmospheric deposition pollutants to levels below generally accepted levels of concern and levels of acceptable change.

### Q.1.2 Characterization of Air Resources within the Rock Springs Planning Area

The air analysis included in the Rock Springs RMP identifies potential air resource impacts that could be affected by future BLM-authorized activities. An air emissions inventory was compiled for the planning area to determine the relative magnitude of air pollutant emissions associated with BLM actions and to compare emissions between alternatives. This emissions inventory is summarized in the Chapter 4, Air Quality section in the RMP/Environmental Impact Statement (EIS). Additional detail including methods and assumptions used in compiling the emissions inventory, are presented in the *Technical Support Document for Air Quality* (Appendix Q). Emissions were calculated using assumptions about the likelihood of potential future activities occurring under each alternative. As a result, the compiled air emissions inventory represents a comparison of emissions of air pollutants based on best available information for future development projections. The emissions inventory is valuable for contrasting the impact of land use allocations on air resources among alternatives and useful for identifying activities that are likely to be major contributors of emissions. This AQAMS includes strategies that could be implemented by the BLM to address the following identified air quality issues:

- Air pollutant emissions – BLM-authorized activities within the planning area have the potential to emit criteria air pollutants, hazardous air pollutants (HAP), or greenhouse gases (GHG). Emissions of some pollutants may be emitted in quantities that could result in adverse impacts to air quality. Of the BLM authorized activities analyzed in the RMP, oil and gas development activities were shown to have the largest potential for increases in these pollutants.
- Ozone nonattainment – portions of the planning area are located within the Upper Green River Basin (UGRB) ozone nonattainment area. BLM authorized activities, such as oil and gas and other mineral development, have the potential to emit ozone precursor emissions and may adversely impact ozone concentrations in the region. The BLM must comply with General Conformity requirements within the ozone nonattainment area.
- Visibility and atmospheric deposition – the planning area is surrounded by several Class 1 areas including Bridger, Fitzpatrick, and Mt. Zirkel Wilderness Areas. Emissions of nitrates, sulfates, and particulate matter from potential future oil and gas and other mineral development activities could cause decreases in scenic visual quality as well as changes to aquatic and soil chemistry, toxic effects in freshwater biota, and changes in plant community composition.

## **Q.2 GENERAL CONDITIONS**

### **Q.2.1 BLM Responsibilities under the Federal Land Policy and Management Act, the Mineral Leasing Act, and the National Environmental Policy Act**

Under the Federal Land Policy and Management Act (FLPMA), the BLM is required to manage public lands in a manner that will protect the quality of air and atmospheric values [FLPMA Sec. 102(a)(8)]. The FLPMA also provides that the public lands be managed in a manner which recognizes the Nation's need for domestic sources of minerals, food, timber, and fiber from the public lands and includes provisions for implementing the Mining and Minerals Policy Act of 1970 [FLPMA Sec. 102(a)(12)]. Further, the FLPMA provides that "In the development and revision of land use plans, the Secretary shall provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, or other pollution standards or implementation plans;" [FLPMA Sec. 202(c)(8)]. In addition to its responsibilities under FLPMA, the BLM is required under the Mineral Leasing Act (MLA) to implement the decisions of an RMP in a manner that recognizes valid and existing mineral lease rights. In accordance with the National Environmental Policy Act of 1969 (NEPA), the BLM must take environmental factors into account when considering major federal actions. The BLM uses the NEPA process to analyze potential impacts of proposed actions on air resources and to consider appropriate measures to mitigate adverse impacts.

### **Q.2.2 Adaptive Management for Air Resources**

Adaptive management incorporates the principles of monitoring current conditions, predicting future impacts, and adapting management strategies to account for changing conditions. Components of this adaptive management strategy include 1) air monitoring; 2) emissions inventorying; 3) regional and project specific modeling; 4) annual analyses of air resources management data and strategies; 5) identification of mitigation measures; and 6) evaluation of the effectiveness of this AQAMS.

### **Q.2.3 Review of Strategy Effectiveness**

The BLM will periodically conduct a review of relevant air resources management data in order to implement and improve the adaptive management strategy. This review would be triggered by monitored exceedances of a measured National Ambient Air Quality Standards (NAAQS) at any air monitoring station within or adjacent to the planning area or at least every three years. The BLM will use the results of the

review to determine if this AQAMS is meeting the goals and objectives for air resources established in the Rock Springs RMP and if it should be updated or revised. The review may include one or more of the following tasks:

- Evaluation of current air monitoring data and trends from air monitoring sites located within and adjacent to the planning area to determine the status of current air quality conditions including measured concentrations approaching or exceeding any NAAQS or Wyoming Ambient Air Quality Standards (WAAQS) or including measured adverse impacts on air quality related values in Class I areas or sensitive Class II areas (as identified on a case-by-case basis by Wyoming Department of Environmental Quality [WDEQ] or a federal land management or tribal agency)
- Review of BLM authorized federal mineral development projects, or other potentially significant emission-generating projects authorized by the BLM within the planning area and comparison to the level of emissions analyzed in the Rock Springs RMP
- Evaluation of available reasonably foreseeable oil and gas development projections within the planning area for the upcoming three- to five-year period and comparison to the level of predicted future development analyzed in the Rock Springs RMP or other applicable regional or project-specific air impacts analysis
- Review of air quality modeling results from impact analyses conducted by the BLM, WDEQ, or other federal or tribal agencies within the previous 12 months that affect or are affected by BLM-authorized activities within the planning area.

#### **Q.2.4 Revision of the Air Quality Adaptive Management Strategy**

The AQAMS is not a decision document, but rather an implementation strategy to address potential air quality concerns within the Rock Springs planning area. Therefore, the AQAMS may be modified as necessary to comply with changing laws, regulations, BLM policy, or to address new information and changing circumstances. Changes to the goals, objectives, or management actions set forth in the Rock Springs RMP would require maintenance or amendment of the Rock Springs RMP; however, changes to implementation, including modifying this AQAMS, may be made without maintaining or amending the RMP.

### **Q.3 OZONE NONATTAINMENT AND GENERAL CONFORMITY**

The UGRB was officially designated by the Environmental Protection Agency (EPA) as an ozone nonattainment area with a marginal classification in May 2012. The nonattainment area includes all of Sublette county and portions of Sweetwater and Lincoln counties. Section 176(c)(1) of the Clean Air Act (CAA) and the General Conformity regulations in 40 Code of Federal Regulations (CFR) 93 Subpart B and Chapter 8, Section 3 of the Wyoming Air Quality Standards and Regulations (WAQSR) require any entity of the federal government that authorizes, permits, licenses, conducts, or approves an activity that has the potential to emit the nonattainment pollutant (or precursors) to demonstrate that the action conforms to the applicable State Implementation Plan for achieving and maintaining the NAAQS and WAAQS before the action is otherwise approved.

The process to evaluate a proposed federal action within a nonattainment area involves the General Conformity applicability review and analysis, the General Conformity evaluation and determination process, and the General Conformity Determination. The applicability review process and analysis are required for any federal action (unless it is exempt) that would contribute pollutant emissions within the nonattainment area. A Conformity Determination is required for each nonattainment pollutant (and its precursors) where the total of direct and indirect net annual emissions in a nonattainment or maintenance area would equal or exceed the General Conformity de minimis thresholds. The de minimis thresholds are

based on the severity of the nonattainment status. The UGRB was designated as marginal nonattainment for ozone (2008 standard) by the EPA; thus, the applicable de minimis thresholds for the ozone precursors of nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOC) are 100 tons per year for any federal action.

The General Conformity regulations under WAQSR Chapter 8 Section 3(c) exempt specific actions from conformity determinations. Exempted activities include: actions where the total of direct and indirect emissions are below the de minimis levels; actions which would result in no emissions increase; routine maintenance, repair, and administrative activities; actions where the emissions are not reasonably foreseeable; the portion of an action that includes major or minor new or modified stationary sources that require a permit under the New Source Review program (WAQSR Chapter 6, Section 2).

## **Q.4 INTERAGENCY AIR RESOURCES COLLABORATION**

The CAA is the comprehensive federal law that provides for regulation of air emissions from stationary and mobile sources, the protection of public health and welfare through the NAAQS, and protection of visibility in designated Class I areas. The WDEQ has been delegated authority by EPA to implement the CAA within Wyoming. WDEQ has the primary responsibility for protecting air resources, regulating emissions sources, and maintaining air quality standards. The BLM has a responsibility to identify and address air quality issues attributable to our actions and within our authority while upholding our responsibility to manage public lands for multiple use. In addition, other federal, state, and tribal agencies also play an important role in air resource management. Interagency collaboration is key to comprehensive management of air quality, as no single agency has all the necessary tools to solve these complex issues alone. To that end, the BLM will work collaboratively with other agencies involved in the management of air resources to develop a comprehensive strategy to manage and protect air resources within the Rock Springs planning area from BLM authorized projects and activities.

### **Q.4.1 Coordination with Wyoming Department of Environmental Quality**

Since the late 1990s, the BLM has developed a cooperative working relationship with the WDEQ Air Quality Division (WDEQ-AQD) to address potential air quality and visibility impacts from its planning and authorizing actions through the NEPA process. The BLM and WDEQ staff have fostered a working relationship emphasizing coordination while respecting the State of Wyoming's regulatory authority. The BLM recognizes WDEQ's delegated authority under the CAA and primacy related to air quality issues. The WDEQ-AQD has developed air quality regulations and permitting requirements for the construction and operation of air pollution sources within both attainment and nonattainment areas. Regulations for permitting the construction, operation, and modification of air emissions sources are codified in WAQSR Chapter 6 Permitting Requirements. The WDEQ has also developed guidance on Best Available Control Technology (BACT) specific to the oil and gas industry that can be found in WDEQ's *Oil and Gas Production Facilities Chapter 6, Section 2 Permitting Guidance*, revised May 2016. Regulations pertaining to federal actions within a nonattainment area are codified in WAQSR Chapter 8 Nonattainment Area Regulations.

Before issuing any approval or Record of Decision (ROD) for federal mineral development projects or other proposed actions with the potential to generate significant emissions of regulated air pollutants within the planning area, the BLM will consult with WDEQ on strategies for analyzing and mitigating potential impacts to air quality from the proposed action. The BLM will keep WDEQ apprised of reasonably foreseeable development on public lands that may have the potential to impact air resources. Additionally, the BLM will collaborate with WDEQ on supporting regional air monitoring and modeling efforts.

## **Q.4.2 Intermountain West Data Warehouse – Western Air Quality Study**

The BLM Wyoming State Office has been an active participant in the Intermountain West Data Warehouse – Western Air Quality Study (IWDW-WAQS); previously known as the Three-State Study, since 2010. The IWDW-WAQS provides high-quality tools for understanding and assessing the effects of current and future energy development and associated emissions on air quality in the Rocky Mountain west. The IWDW-WAQS is a cooperative venture between federal land management agencies, including the BLM, U.S. Forest Service (USFS), U.S. Fish and Wildlife Service (USFWS), and the National Park Service (NPS) as well as the EPA and state agencies from Wyoming, Colorado, Utah, and New Mexico. As part of this project, the BLM has provided significant funding for air monitoring, regional photochemical grid modeling, and oil and gas basin emissions inventories. As part of its adaptive management response to regional air quality issues within and surrounding the planning area, the BLM is committed to continued participation in the IWDW-WAQS and will continue to provide support for regional analyses, monitoring, and emission inventory development as funding allows. Additional information on the IWDW-WAQS project can be found at the IWDW website: <http://views.cira.colostate.edu/TSDW/>.

## **Q.5 AIR RESOURCE MANAGEMENT**

### **Q.5.1 Air Analysis for Authorized Emissions Generating Activities**

As part of the NEPA process and prior to authorization of any proposed federal mineral development activity or other proposed project with the potential to generate emissions of regulated air pollutants above levels of concern as identified during project scoping, the BLM will conduct an air analysis to determine the magnitude of potential impacts on air quality based on the estimated emissions from the activity being authorized.

The BLM will consider the following analysis criteria to identify pollutants of concern and inform decisions regarding the appropriate level of air analysis to be conducted for oil and gas development activities and may consider these criteria for other activities with the potential to generate emissions of regulated air pollutants:

- magnitude of potential air emissions from the proposed activity
- duration of proposed activity
- proximity to a federally mandated Class I area, sensitive Class II area (as identified on a case-by-case basis by WDEQ or a federal land management or tribal agency), population center, or other sensitive receptor
- location within or adjacent to a non-attainment or maintenance area
- meteorological and geographic conditions
- existing air quality conditions including measured exceedances of NAAQS or WAAQS and measured adverse impacts on air quality related values from BLM authorized projects and activities
- intensity of existing and projected development in the area
- issues identified during project scoping.

### **Q.5.2 Emissions Inventory**

The BLM may require the proponent of a federal mineral development activity (as proposed in a permit application, plan of development, or other application) to submit an emissions inventory of direct and



indirect emissions associated with the proposed project when determined necessary to complete an analysis in accordance with NEPA. The BLM may request submittal of an emissions inventory for other proposed activities that have the potential to generate emissions of regulated air pollutants based on the analysis criteria included in Q.5.1. When required, any submitted emissions inventory must include estimated emissions of regulated air pollutants from all sources related to the proposed activity, including fugitive emissions, HAPs, and GHG emissions, for each year or distinct phase over the life of the project. The BLM will review the emissions inventory to determine its completeness and accuracy. In many cases, the BLM will accept inventory data reported to other state or federal regulatory agencies. Emission control measures, in addition to regulatory requirements, included in the emissions inventory assumptions and relied upon to determine project impacts, will become Operator Committed Measures if/when the BLM authorizes an activity.

### **Q.5.3 Emissions Reduction Strategies**

The BLM may request the proponent of a federal mineral development project that has the potential to emit any regulated air pollutants at levels which may cause or contribute to a violation of a Federal or State air quality standard to provide emissions reduction strategies to reduce project related air pollutant emissions including GHGs, HAPs, and fugitive dust. The BLM may request submittal of emissions reduction strategies for other proposed activities that have the potential to generate emissions of regulated air pollutants based on the analysis criteria included in U.5.1. Project proponents for oil and gas development projects should refer to Table Q-1. Best Management Practices for Oil and Gas Development as a reference for potential emission reduction technologies and strategies. The list is not intended to preclude the use of other effective air pollution control technologies that may be proposed. Details of operator committed measures submitted by the applicant will be included in and enforced as a condition of approval in the BLM-issued authorization.

### **Q.5.4 Air Monitoring**

The BLM recognizes that ambient air monitoring provides valuable data for determining current and background concentrations of air pollutants, describing long term trends in air pollutant concentrations, and evaluating the effectiveness of air control strategies. The BLM will cooperate with WDEQ to support a comprehensive air monitoring network within the planning area and areas potentially affected by BLM authorized activities within the planning area. The BLM will continue to support its Wyoming Air Resource Monitoring System (WARMS) air monitoring network, contingent upon available funding. Additional information on this network can be found at <https://www.blmwarms.net/index.html>. The BLM will also work collaboratively with the USFS, NPS, USFWS, or other entities to support the collection of air quality data in an effort to better understand the impacts of atmospheric deposition and visibility impairment within the planning area. This collaboration may be facilitated through interagency partnerships including the Greater Yellowstone Coordinating Committee, Western Regional Air Partnership, and National Atmospheric Deposition Program.

### **Q.5.5 Project Specific Air Monitoring**

The BLM may require as part of the air analysis (Section U.5.1) that project proponents provide new and/or existing air monitoring data from a site within, adjacent to, or representative of the proposed development area. The purpose of this air monitoring is to establish baseline air quality conditions prior to development at the site. The requirement for providing air monitoring data will be based on the analysis criteria listed in Section U.5.1 and the availability or absence of existing representative air monitoring data.

The project proponent will be responsible for funding, siting, installing, operating, and maintaining any air monitoring equipment if monitoring is required in the absence of existing representative air monitoring data. Project-specific monitoring data may be used by the BLM in subsequent NEPA analyses required for

project approvals. Air monitoring data used to inform an authorization decision will be disclosed through the NEPA process. Additionally, the BLM will ensure that ambient air monitoring data collected as a Condition of Approval for any BLM authorized activity will be made publicly available.

### **Q.5.6 Modeling**

Air dispersion and photochemical grid models are useful tools for predicting project-specific impacts on air quality, predicting the potential effectiveness of control measures and strategies, and forecasting trends in regional concentrations of air pollutants. The BLM will use regional air modeling and project-specific modeling, in conjunction with other air analysis tools, to develop air resource protection strategies consistent with its responsibilities under FLPMA. Further, the BLM will use modeling of projected air emissions to evaluate the direct, indirect, and cumulative impacts of proposed actions as part of an analysis in accordance with NEPA. The BLM will support and participate in regional modeling efforts through multi-state and/or multi-agency organizations, such as the IWDW and the Western Regional Air Partnership. In addition, the BLM will conduct or facilitate regional air modeling as outlined in Section U.4.2 or other regional study, contingent upon available funding.

### **Q.5.7 Project-Specific Modeling**

The BLM may require project-specific air quality modeling to analyze potential impacts from a proposed federal mineral development project or other proposed activity that has the potential to emit regulated air pollutants in order to evaluate the effectiveness of any air emission control measures. The BLM will determine the parameters required for a project-specific modeling analysis through the development of a modeling protocol for each analysis. Project proponents may submit results from other modeling analyses that include the proposed action or activities similar to the proposed project for the BLM's review and approval. The decision to require air quality modeling will be based on the analysis criteria listed in Section U.5.1. The BLM may not require an air modeling analysis when it can be demonstrated that the project will not cause a substantial increase in emissions of the pollutants of concern.

### **Q.5.8 Air Resources Mitigation Measures**

Many activities the BLM authorizes, permits, or allows, may generate air pollutant emissions that have the potential to adversely impact air quality. The primary mechanism to reduce air quality impacts is to reduce emissions via project design features and mitigation. Appropriate emission reduction measures are best identified and required at the project authorization stage, when the temporal and spatial characteristics and technological specifications of the proposed action have been defined. The project-specific information available at that stage allows for the development of an emissions inventory and impact analysis that can be used to identify effective mitigation options for predicted adverse impacts.

The BLM will ensure implementation of reasonable air emissions control measures, design features, operator committed measures, or mitigation within its regulatory authority if an air quality impact analysis shows that future impacts are predicted to exceed a NAAQS or WAAQS or levels of concern for air quality related values in a Class I area, or if a BLM authorized source caused or contributed to a monitored exceedance of a NAAQS or WAAQS as determined by WDEQ in consultation with the BLM. Control measures would be implemented through appropriate mechanisms as provided for by law and consistent with lease rights and obligations. In the absence of, or in addition to effective control technologies, the BLM may manage the pace, place, density, and intensity of development to meet air quality standards. Project proponents for oil and gas development projects should refer to Table Q-1. Best Management Practices for Oil and Gas Development, as a reference for potential emission reduction technologies and strategies. The list is not intended to preclude the use of other effective air pollution control technologies that may be proposed.

### Q.5.9 Lease Notice for Oil and Gas Development within the Upper Green River Basin Ozone Nonattainment Area

The BLM will attach the following lease notice to all offered lease parcels located within the Rock Springs planning area that lie within the UGRB Ozone nonattainment area.

***Lease Notice:** Prior to project-specific approval, additional air resource analyses will be required in order to comply with General Conformity requirements under the Clean Air Act. The lessee/operator will be required to provide a complete emissions inventory, and may be required to provide air monitoring data, and/or modeling results for an analysis of impacts to air quality or air quality related ozone levels. Interagency consultation may be initiated with affected land managers and air quality regulators to determine potential mitigation options for any predicted impacts from the proposed development. The analysis and consultation may result in the imposition of additional project-specific best management practices to minimize emissions of ozone-precursors if the proposed operation would not comply with the General Conformity regulations.*

**Table Q-1. Best Management Practices for Oil and Gas Development**

Recommended Emission Reduction Measure	Potential Environmental Benefits	Potential Environmental Liabilities
<b>Control Strategies for Drilling and Compression</b>		
Multi-well pad directional or horizontal drilling.	When compared to single pad vertical drilling, reduces construction related emissions, decreases surface disturbance, reduces trip frequencies, and reduces habitat fragmentation.	Could result in higher air impacts in one area with longer sustained drilling times. Depends on geological strata, topography, and other physical constraints.
Improved engine technology (Tier 4) for diesel drill rig engines.	Reduced NOx, PM, CO, and VOC emissions.	Dependent on availability of technology from engine manufacturers and, potentially differentials in cost for small operators.
Selective Catalytic Reduction (SCR) for drill rig engines and/or compressors.	NOx emissions reduction, potential decreased formation of visibility impairing compounds and ozone. NOx control efficiency of 95% achieved on drill rig engines. NOx emission rate of 0.1 g/hp-hr achieved for compressors.	Potential NH3 emissions and formation of visibility impairing ammonium nitrate. Regeneration/disposal of catalyst can produce hazardous waste.
Non-selective catalytic reduction (NSCR) for drill rig engines and/or compressors.	NOx emissions reduction, potential decreased formation of visibility impairing compounds, and ozone. NOx control efficiency of 80-90% achieved for drill rig engines. NOx emission rate of 0.7 g/hp-hr achieved for compressor engines greater than 100 hp.	Regeneration/disposal of catalysts can produce hazardous waste. Not applicable to lean burn or 2-stroke engines.
Natural Gas fired drill rig engines.	NOx emissions reduction, potential decreased formation of visibility impairing compounds, and ozone.	May require construction of infrastructure (pipelines and/or gas treatment equipment). May require onsite gas storage. May require additional engines to supplement needed torque.

Recommended Emission Reduction Measure	Potential Environmental Benefits	Potential Environmental Liabilities
Electrification of drill rig engines and/or compressors.	Decreased emissions at the source. Transfers emissions to more efficiently controlled source (EGU).	Displaces emissions to EGU. May require construction of power lines.
Improved engine technology (Tier 2, 3 or 4) for all mobile and non-road diesel engines.	Reduced NO <sub>x</sub> , PM, CO, and VOC emissions.	Dependent on availability of technology from engine manufacturers.
Reduced emission (a.k.a. "green") completions.	Reduction in VOC and CH <sub>4</sub> emissions. Reduces or eliminates flaring and venting and associated emissions. Reduces or eliminates flowing back into open pits and associated evaporative emissions. Increased recovery of gas to pipeline rather than atmosphere.	May result in temporary increase in truck traffic and associated emissions due to delivery of onsite equipment or due to construction of infrastructure.
Flaring of completion emissions.	Reduces methane, VOC, and some HAP emissions. Converts CH <sub>4</sub> to CO <sub>2</sub> .	Some emissions from combustion of flaring gas.
Minimize/eliminate venting and/or use closed loop process where possible during "blow downs."	Reduces methane, VOC, and some HAP emissions.	Depends on frequency and pressure. May require onsite equipment.
Eliminate evaporation pits for drilling fluids.	Reduces VOC and GHG emissions. Reduces potential for soil and water contamination. Reduces odors and potentially surface disturbance.	May increase truck traffic and associated emissions. Requires tank and/or pipeline infrastructure.
Electrification of wellhead compression/ pumping.	Reduces local emissions of fossil fuel combustion and transfers to more easily controlled source.	Displaces emissions to EGU. Depends on availability of power lines.
Wind (or other renewable) generated power for compressors.	Low or no emissions.	May require construction of infrastructure. Visual impacts. Potential wildlife impacts.
Compressor seals – replace wet with dry or use mechanical seal.	Reduce gas venting (VOC and GHG emissions).	May not be mechanically feasible. May be costly.
Compressor rod packing system – use monitoring and replacement system.	Reduce gas leaks (VOC and GHG emissions).	Requires establishing a monitoring system and doing replacements.
<b>Control Strategies Utilizing Centralized Systems</b>		
Centralization (or consolidation) of gas processing facilities (e.g., separation, dehydration, sweetening).	Reduces vehicle miles traveled (truck traffic) and associated emissions. Reduced VOC and GHG emissions from individual dehydration/ separator units.	Temporary increase in construction associated emissions. Higher potential for pipe leaks.
Liquids Gathering systems (for condensate, gas, and produced water).	Reduces vehicle miles traveled and associated emissions. Reduced VOC and GHG emissions from tanks, truck loading/unloading, and multiple production facilities.	Temporary increase in construction associated emissions. Higher potential for pipe leaks. Requires pipeline infrastructure.
Water and/or fracturing liquids delivery system.	Reduced long term truck traffic and associated emissions.	Temporary increase in construction associated emissions. Higher potential for pipe leaks. Requires pipeline infrastructure.

Recommended Emission Reduction Measure	Potential Environmental Benefits	Potential Environmental Liabilities
<b>Control Strategies for Tanks, Separators, and Dehydrators</b>		
Eliminate use of open top tanks.	Reduced VOC and GHG emissions.	
Capture and control of flashing emissions from all storage tanks and separation vessels with vapor recovery and/or thermal combustion units.	Reduces VOC and GHG emissions.	Pressure buildup on older tanks can lead to tank rupture and release.
Capture and control of produced water, crude oil, and condensate tank emissions.	Reduces VOC and GHG emissions.	
Capture and control of dehydration equipment emissions with condensers, vapor recovery, and/or thermal combustion.	Reduces VOC, HAP, and GHG emissions.	May create emissions from combustion of gas used for heating.
Use zero emissions dehydrators or use desiccants dehydrators.	Reduces VOC, HAP, and GHG emissions. Can be as effective as Triethylene Glycol dehydration.	Requires desiccants (salt tablets). Process results in the formation of a brine solution that must be disposed of.
<b>Control Strategies for Miscellaneous Fugitive VOC Emissions</b>		
Install plunger lift systems to reduce well blow downs.	Reduces VOC and GHG emissions. Can be more efficient at fluids removal than other methods.	Must have adequate pressure.
Install and maintain low VOC emitting seals, valves, hatches on production equipment.	Reduces VOC and GHG emissions.	
Initiate equipment leak detection and repair program (e.g., including use of forward-looking infrared cameras, grab samples, organic vapor detection devices, and/or visual inspection).	Reduction in VOC and GHG emissions.	
Install or convert gas operated pneumatic devices to electric, solar, or instrument (or compressed) air driven devices/controllers.	Reduces VOC and GHG emissions.	Electric or compressed air driven operations can displace or increase combustion emissions.
Use "low" or "no bleed" gas operated pneumatic devices/controllers.	Reduces VOC and GHG emissions.	
Use closed loop system or thermal combustion for gas operated pneumatic pump emissions.	Reduces VOC and GHG emissions.	
Install or convert gas operated pneumatic pumps to electric, solar, or instrument (or compressed) air driven pumps.	Reduces VOC and GHG emissions.	Electric or compressed air driven operations can displace or increase combustion emissions.
Install vapor recovery on truck loading/unloading operations at tanks.	Reduces emissions of VOC and GHG emissions.	Pressure build up on older tanks can lead to uncontrolled rupture.

Recommended Emission Reduction Measure	Potential Environmental Benefits	Potential Environmental Liabilities
<b>Control Strategies for Fugitive Dust and Vehicle Emissions</b>		
Unpaved surface treatments including watering, chemical suppressants, and gravel.	20% - 80% control of fugitive dust (particulates) from vehicle traffic.	Potential impacts to water and vegetation from runoff of suppressants.
Use remote telemetry and automation of wellhead equipment.	Reduces vehicle traffic and associated emissions.	Not possible in some terrain or conditions.
Speed limit restrictions on unpaved roads.	Reduction of fugitive dust emissions.	
Reduce commuter vehicle trips through car pools, commuter vans or buses, innovative work schedules, or work camps.	Reduced combustion emissions, reduced fugitive dust emissions, reduced ozone formation, reduced impacts to visibility.	
<b>Miscellaneous Control Strategies</b>		
Use of ultra-low sulfur diesel (e.g., in engines, compressors, construction equipment).	Reduces emissions of particulates and sulfates.	Dependent up on availability of ultra-low sulfur diesel.
Reduce unnecessary vehicle idling.	Reduced combustion emissions, reduced ozone formation, reduced impacts to visibility, reduced fuel consumption.	
Reduced pace or phased development.	Peak emissions of all pollutants reduced.	Emissions generated at a lower rate but for a longer period. Life of project, duration of impacts is longer but of a lesser intensity.

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## **APPENDIX R—APPROPRIATE MANAGEMENT LEVELS FOR HERD MANAGEMENT AREAS**

As part of the process to revise the Rock Springs Resource Management Plan (RMP), the Bureau of Land Management (BLM) Rock Springs Field Office (RSFO) is evaluating the Appropriate Management Level (AML) for the Little Colorado Herd Management Area (HMA). The purpose of this appendix is to demonstrate the analysis of AML for the HMA in the planning area.

AML establishes the number of wild horses to be managed within an HMA. AML is expressed as a population range with an upper and lower limit. The AML upper limit is the number of wild horses which results in a Thriving Natural Ecological Balance (TNEB) and avoids a deterioration of the range. The AML lower limit is normally set at a number that allows the population to grow to the upper limit over a 4- to 5-year period, without any interim gathers to remove excess wild horses.

### **R.1 LITTLE COLORADO**

**Table R-1. Wild Horse Management in the Little Colorado HMA**

	<b>Existing Management Alternative A</b>
<b>AML</b>	69-100
<b>Acres within the HMA</b>	630,759
<b>Acres per wild horse at High AML</b>	6,307
<b>Annual AUMs needed to Support Wild Horses at High AML</b>	1,200

The *Wild Horses and Burros Management Handbook* (H-4700-1) provides an outline of a three-tiered analysis for establishing and adjusting the AML:

- The Tier 1 analysis determines whether the four essential habitat components (forage, water, cover, and space) are present in sufficient amounts to sustain healthy wild horse populations and healthy rangelands over the long-term.
- The Tier 2 analysis determines the amount of sustainable forage available for wild horse use.
- The Tier 3 analysis determines whether or not the projected wild horse herd size is sufficient to maintain genetically diverse wild horse populations (i.e., avoid inbreeding depression).

This document follows this three-tiered analysis approach for assessing AML for the Little Colorado HMA.



## Tier 1 Analysis: Sufficient Forage, Water, Cover and Space

**Table R-2. Summary of the Adequacy of Wild Horse Habitat within the Little Colorado Herd Management Area**

HMA Name	Forage		Water		Cover		Space	
	Sufficient	Insufficient	Sufficient	Insufficient	Sufficient	Insufficient	Sufficient	Insufficient
Little Colorado	X		X		X		X	

The Little Colorado HMA was established in August 1997, with the approval of the Green River RMP. The AML for the Little Colorado HMA is currently set at a range of 69 to 100 wild horses. This HMA contains approximately 630,759 acres. The Little Colorado HMA consists mostly of BLM and Bureau of Reclamation lands managed by the RSFO. Elevation ranges from 6,250 feet along the Big Sandy River to over 7,489 feet in the Figure Four Canyon area. Summers are hot, and winters can range from mild to bitterly cold. Annual precipitation ranges from less than seven to more than 12 inches per year. About half of the precipitation falls during the growing season from April through June, with the remainder coming in high intensity summer thunderstorms and winter snowfall. Much of the precipitation from summer thunderstorms runs off in numerous drainages. Some of this water is captured in reservoirs or pits. Flowing wells, springs, and creeks are the primary sources of water for wild horses, livestock, and wildlife. The Little Colorado HMA contains approximately 89 wells/reservoirs and approximately 26 miles of stream, providing plenty of water sources for wild horses to utilize distributed throughout the HMA.

The vegetation communities in the Little Colorado HMA are very diverse in this large area, reflecting the diversity in soils, topography, and geology found there. The high-elevation, cold-desert vegetation of the project area is composed predominately of Wyoming big sagebrush/grass and Gardner saltbush vegetation communities. Other plant communities present include desert shrub, grassland, mountain shrub, juniper woodlands, and a very few aspen woodlands. Needle-and-thread, Indian ricegrass, bluebunch wheatgrass, western wheatgrass, junegrass, basin wildrye, sandhill muhly, Canby and little bluegrass, and threadleaf sedge are the predominant grasses and grass-like species. Wyoming big sagebrush, black sagebrush, bud sage, birdsfoot sage, Gardner's saltbush, spiny hopsage, four-wing saltbush, greasewood, bitterbrush, winterfat, horsebrush, Douglas and rubber rabbitbrush, and true mountain mahogany are important shrub species. Forbs are common and variable depending on the ecological site and precipitation zone.

Wild horses generally prefer perennial grass species as forage when available. Shrubs are more important during the fall and winter, and in drought years. The species of grasses preferred depends on the season of the year. Needle-and-thread and Indian ricegrass are most important during the winter and spring and wheatgrasses during the summer and fall.

Overall, the habitat within the Little Colorado HMA provides adequate forage, water, cover, and space to sustain a viable and healthy wild horse population, while maintaining TNEB.

## Tier 2 Analysis: Sustainable Forage

**Table R-3. Summary of Wild Horse Populations, Utilization and Precipitation from 2008 – 2015.**

Year	Wild Horse Population	Wild Horse Animal Unit Months Utilized	Average % Utilization Monitored	Annual Precipitation (inches) (30-Year Average = <u>6.45</u> in) Big Piney
2008	69	828	20%	5.77
2009	83	996	18%	9.0
2010	152	1,824	25%	4.78
2011	256	3,072	20%	3.67
2012	70	840	19%	2.53
2013	88	1,056	22%	4.64
2014	104	1,248	2%	4.79
2015	259	3,108	21%	6.87
Average	135	1,621	18%	5.2

The data in Table R-3 provides historical information on wild horses, climate and forage utilization under Existing Management. Data is provided from 2008-2015 as this was the period when utilization monitoring data was available for this area.

Overall, the eight-year evaluation period occurred during a drought. The 30-year average annual precipitation for this area is 6.45 inches. During the eight-year period shown in Table V-7, average precipitation was 5.2 inches, with only two years being above average and six years below average.

Within these climatic conditions, and with an average wild horse population of 135, average utilization levels were at 18% for the assessment period. Utilization standards for this area seek to ensure utilization levels are below 50% in the uplands. It is important to note that utilization levels take into account all potential sources of defoliation such as livestock, wildlife, wild horses, etc.

**Table R-4. Summary of Land Health Standards for Allotments within the Little ColoradoHerd Management Area**

Allotment	Year of Land Health Assessment	Standard 1 Soils	Standard 2 Riparian	Standard 3 Upland Vegetation	Standard 4 Plant and Animal Habitat	Standard 5 Water Quality	Standard 6 Air Quality
Big Sandy	2013						
Lombard	2013		X				
Eighteen Mile	2013		X				
Figure Four	2002						
Sublette	2002						
Boundary	2002						

Blank indicates the land health standard is being met.  
X – Indicates that the land health standard is not being met.

Table R-4 summarizes the results of the most recent land health standards for allotments within the Little Colorado HMA. As shown, the primary concern with land health conditions within the HMA are riparian areas. While wild horses can utilize riparian areas, they have not been identified as a primary causal factor to these riparian areas not meeting land health standards. The main reason that Standard #2 is not being met is due to the dam on the Big Sandy River. The water levels on the Big Sandy River are maintained and the water levels do not fluctuate as needed for woody vegetation to be established and maintained.

At high AML (100 wild horses) in the Little Colorado HMA, there would be approximately 6,307 acres per wild horse and these wild horses would utilize 1,200 AUMs per year. Historic utilization levels show that even when wild horse populations were significantly over their high AML, utilization levels were still substantially below the 50% use objective.

### Tier 3 Analysis: Genetic Diversity

Current genetic diversity is generally good within the Little Colorado HMA, but needs to be monitored closely. The following statement comes from a research report prepared for this HMA regarding genetic diversity:

*“Genetic variability of this herd is moderately high but there is a possibility that herd size has been reduced which could lead to future loss of variation. Genetic similarity results suggest a herd with mixed ancestry that primarily is North American and likely ranch stock.”*

*RECOMMENDATIONS “Current variability levels are high enough that no action is needed at this point. Depending upon the population size the herd may need some monitoring but there should be few or no problems for at least ten years” (Cothran 2010).*

The *Wild Horses and Burros Management Handbook* (H-4700-1) states, “To avoid inbreeding depression in wild horse populations, a minimum herd size of 50 effective breeding animals (a total population size of about 150-200 animals) is recommended.”

High AML for the Little Colorado HMA is below this recommended level; however, wild horses in this HMA have maintained healthy genetics over the past few decades at this AML. Therefore, it is expected that a high AML of 100 wild horses will continue to maintain adequate genetic diversity.

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# APPENDIX S—RECREATION REPORT

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## S.1 RECREATION MANAGEMENT

Over the years, definitions of recreation have differed in their particular emphasis but have shared a common core; recreation is a behavior that individuals choose to engage in for the purpose of realizing experiences and personal benefits, such as renewal or refreshment. The individual attains experiences and benefits by participating in preferred recreation activities in preferred recreation settings.

Public lands can provide visitors a wide array of satisfying recreation experiences. The goal of the public land manager is to provide opportunities for visitors to obtain desired experiences and beneficial outcomes while protecting resources. The manager accomplishes this goal by planning for and managing the physical, social, and operational settings and the activities that occur within them.

Recreation resources and uses are allocated through the land use planning process. During land use planning, an interdisciplinary team considers various management scenarios for all resources that are present within a geographic area to achieve management goals and objectives. Some form of recreation use and associated recreation resources are typically present on the lands and waters managed by Bureau of Land Management (BLM) field offices and are consequently allocated through the land use planning process.

In the last several decades, there has been a growing recognition of how much recreation contributes to the quality of life, economy, society, and environment. Changing public values and expectations of land management agencies to meet the demand for diverse recreation uses has created the need for changes in managing recreation and visitor services.

These changes and resulting advances in recreation management knowledge and practices have been responsible for the evolution from activity-based management to experience-based management and, recently, benefits-based management. Each transition built on the management framework of the previous. Within the BLM, benefits-based management has further transitioned to outcomes-focused management.

### **Outcome Focused Management**

Outcomes-focused management is defined as an approach to recreation management that focuses on the positive outcomes gained from engaging in recreational experiences.

### **Recreation Management Area Designation**

To help effectively manage recreation and visitor services, the BLM designates recreation management areas (RMA), and the areas are classified as either a special recreation management area (SRMA) or an extensive recreation management area (ERMA). Both types of areas are recognized as producing high-quality recreation opportunities and offering beneficial outcomes for recreation participants, recreation-tourism partners, visitor service providers, and communities. Recreation and visitor service objectives in RMAs are recognized as a primary resource management consideration, and specific management is required to protect the recreation opportunities. The RMA designation is based on recreation demands and issues, recreation setting characteristics, resolving use/user conflicts, compatibility with other resource uses, and resource protection needs. There is no requirement to designate all lands as RMAs.

### **Special Recreation Management Areas**

A SRMA is an administrative unit where existing or proposed recreation opportunities and recreation setting characteristics are recognized for their unique value, importance, and/or distinctiveness, especially as compared to other areas used for recreation.

#### **Management Focus**

A SRMA is managed to protect and enhance a targeted set of activities, experiences, benefits, and desired recreation setting characteristics. The land use plan may subdivide an SRMA into recreation management zones (RMZ) to further delineate specific recreation opportunities. Within an SRMA, recreation and visitor services management is recognized as the predominant land use plan focus, where specific recreation opportunities and recreation setting characteristics are managed and protected on a long-term basis.

### **Extensive Recreation Management Areas**

An ERMA is an administrative unit that requires specific management consideration in order to address recreation use, demand, or recreation and visitor services program investments.

#### **Management Focus**

An ERMA is managed to support and sustain principal recreation activities and associated qualities and conditions. Management of ERMAs is commensurate with the management of other resources and resource uses. While generally unnecessary, ERMAs may be subdivided into RMZs to ensure recreation and visitor services are managed commensurate with other resources and resource uses.

The existing Green River Resource Management Plan (RMP) and the Jack Morrow Hills Coordinated Activity Plan identified six special recreation management areas. They are the following:

- Wind River Front
- Green River
- Killpecker Sand Dunes Open Play Area
- Continental Divide National Scenic Trail
- Continental Divide Snow Machine Trail
- Oregon and Mormon Pioneer National Historic Trail.

Additional public scoping identified two additional areas where recreation management for beneficial outcomes may be considered. They are the following:

- Red Creek Badlands
- Little Mountain.

These SRMAs accommodate national visitor demand for destination-oriented recreational opportunities in the Rock Springs Field Office (RSFO). This demand has been identified by onsite customers and community involvement. These areas contain a high diversity of vegetation, wildlife, scenic, historic, and cultural resources providing additional opportunities for outdoor recreation. SRMA management will sustain and enhance these resources as well as accommodate visitor demand. Special Recreation Permits will be allowed in these areas so long as the resource conditions and outcome objectives can be maintained.

## S.2 RECREATION MANAGEMENT AREA PRESCRIPTIONS

### S.2.1 Wind River Front

Supporting information: The west slope of the Wind River Mountains attracts visitors from the surrounding communities and from outside the region due to the spectacular scenery, abundant wildlife, and exposed geologic formations. Nearby attractions which also draw visitors to the area include the Big Sandy Recreation Area and the Prospect Mountains. Also, some visitors traveling to or from Yellowstone National Park spend time in the area. The SRMA includes the Sweetwater Guard Station, Sweetwater Bridge, Dutch Joe, Blucher Creek, and Squaw Creek campgrounds which are BLM managed campgrounds referred to as the Sweetwater Campgrounds. The SRMA also includes the Sweetwater River, which meets national requirements for designation as a Wild and Scenic River. The area also includes the Lander Cutoff of the Oregon Trail. The west slope of the Wind River Mountains provides important wildlife habitat and access into the Bridger Teton National Forest. These resources provide for excellent semi-primitive, and non-motorized recreation as well as motorized (touring) recreation.

#### **Land Use Plan Management Actions/Allowable Uses and Implementation Actions:**

Management – The area includes developed campgrounds and dispersed recreation and camping areas. In areas where overnight camping is allowed, there is a 14-day camping limit.

Administration – The area would be managed as Visual Resource Management Class II. All motorized use would be limited to designated roads and trails. The area is a right-of-way (ROW) avoidance area.

Information and Education – Signage and other visitor controls are installed in this area and more would be added if needed to meet management objectives.

Monitoring – Sites and facilities would be monitored twice per month for each month the area is accessible by the public. Monitoring would include visitor use, recreation caused resource effects or impacts, and visitor satisfaction.

#### **Recreation Setting Characteristics:**

##### *Physical Setting*

Level of:

Remoteness – Within 0.5 mile of four-wheel drive two track routes.

Naturalness – Character of the natural landscape retained. A few of the modifications contrast with the character of the landscape.

Facilities – Maintained and marked trails, simple trailhead developments, basic developed fire pits and toilets.

##### *Social Setting*

Level of:

Contacts – Usually 3-6 encounters/day off travel routes and campsites, and 7-15 encounters/day on travel routes.

Group Size – 4-6 people per group.

Evidence of Use – Areas of alteration uncommon. Little surface vegetation wear observed, sounds of people infrequent.

### ***Administrative Setting***

Level of:

Mechanized Use – Middle Country: Four-wheel drive vehicles, all-terrain vehicles (ATV), dirt bikes, or snowmobiles in addition to non-motorized mechanized use. Back Country: Mountain bikes and other mechanized use, but all is non-motorized.

Visitor Services – Signs present at key access points, but limited. Interpretive signs at trailheads, campgrounds, and parking areas.

Management Controls – Some regulatory and ethics signs. Moderate use restrictions including barriers.

Recreation Activity Opportunities – Hunting, fishing, photography, sightseeing, driving for pleasure, wildlife viewing, horse riding and packing, and hiking.

### **Outcomes (Experience and Benefits):**

Experiences –

- Savoring the total sensory sight, sound, and smell experience of a natural landscape.
- Developing skills and abilities.
- Enjoying exploring on my/our own.
- Enjoying the closeness of family.
- Enjoying the areas wildlife, scenery, views, and aesthetics.

Personal Benefits –

- Improved mental well-being, physical fitness and health maintenance.
- Personal appreciation and satisfaction, a more outdoor-oriented lifestyle.

Community Benefits –

- Maintenance of community's distinctive recreation/tourism market niche or character.
- Increased desirability as a place to live or retire.
- Heightened sense of satisfaction with our community.

Environmental Benefits –

- Greater sensitivity to/awareness of outdoor aesthetics, nature's art and its elegance.
- Increased appreciation of area's cultural history.

Economic Benefits –

- Positive contributions to local/regional economic stability.
- More positive contributions to local/regional economy.

## **S.2.2 Green River**

Supporting information: The Green River SRMA is made up of BLM and Bureau of Reclamation managed public lands. The river is very popular for fishing, floating, sightseeing, and hunting and is used by local residents as well as visitors from throughout the nation and from foreign countries. Many visitors traveling to or from Yellowstone National Park spend time in the area. The Green River is listed as a blue-ribbon

fishery with semi-developed and primitive put-in and take-outs. The river contains islands, as well as other scattered tracts of public land that provide for river access.

#### **Land Use Plan Management Actions/Allowable Uses and Implementation Actions:**

Management – The area includes dispersed recreation areas. In areas where overnight camping is allowed, there is a 14-day camping limit.

Administration – The area would be managed as Visual Resource Management Classes II and III. All motorized use would be limited to designated roads and trails. All river access routes will be preserved. The area is a ROW avoidance area.

Information and Education – Signage and other visitor controls are installed and more would be added if needed to meet management objectives.

Monitoring – Sites and facilities would be monitored twice per month for each month the area is accessible by the public. Monitoring would include visitor use, recreation caused resource effects or impacts, and visitor satisfaction.

#### **Recreation Setting Characteristics:**

##### ***Physical Setting***

Level of:

Remoteness – Within 0.5 mile of low-clearance or passenger vehicle routes.

Naturalness – Character of the natural landscape partially modified, but modifications do not overpower natural landscapes.

Facilities – Facilities such as campsites, restrooms, river access, and trailheads.

##### ***Social Setting***

Level of:

Contacts – Usually 30 encounters/day on travel routes.

Group Size – 4-6 people/group.

Evidence of Use – Front Country: Small areas of alteration prevalent. Surface vegetation gone with compacted soils observed. Sounds of people regularly heard. Middle Country: Small areas of alteration. Surface vegetation showing wear with some bare soils. Occasional sounds of people.

##### ***Administrative Setting***

Level of:

Motorized Use – The majority of the river tracts are a Front Country setting where two-wheel drive vehicles are predominant, but also four-wheel drive vehicles and non-motorized mechanized use occurs.

Visitor Services – On site controls and services are present but harmonize with the natural environment.

Management Controls – Continue to provide for experiences and associated facilities with an emphasis on maintaining Rural to Front Country recreation settings.

Recreation Activity Opportunities – Fishing, hunting, floating, photography, and sightseeing.



**Outcomes (Experience and Benefits):**

## Experiences –

- Enjoy going exploring on my/our own.
- Enjoy the closeness of family.
- Experiencing a greater sense of independence.
- Testing endurance.
- Enjoy risk taking adventure.

## Personal Benefits –

- Improved mental well-being.
- Closer relationship with the natural world.
- Enhanced sense of personal freedom.

## Community Benefits –

- Heightened sense of satisfaction with our area as a place to live.
- Greater community involvement in recreation and other land use decisions.

## Environmental Benefits –

- Maintenance of distinctive recreation character.
- Greater retention of distinctive natural landscape features.

## Economic Benefits –

- Increased local job opportunities.
- Increased local tourism revenue.
- Improved local economic stability.

**S.2.3 Killpecker Sand Dunes Open Play Area**

Supporting information: This area is located 23 miles north and east of the city of Rock Springs, Wyoming. This area is currently being used for cross country and off-road motor vehicle use by both off-highway vehicles (OHV) and motorcycles as well as other specialty designed vehicles such as sand rails and utility terrain vehicles (UTV). Visitors are from within the local communities, as well as from outside the area. The area is composed of sand dunes and mostly devoid of vegetation.

The Killpecker Sand Dunes area provides for exceptional motorized hill climbing opportunities ranging from novice riders to very challenging climbs for the experienced riders. Local communities have identified this area as highly desired for motorized recreational opportunities.

**Land Use Plan Management Actions/Allowable Uses and Implementation Actions:**

Management – The area includes developed campgrounds and dispersed camping and recreation areas. In areas where overnight camping is allowed, there is a 14-day camping limit. Only the shifting sand portion of the sand dunes is available for off road use.

Administration – The area would be managed as Visual Resource Management Class III. Mineral material sales and/or free use permits will be prohibited.

Information and Education – Signage and other visitor controls are installed and more would be added if needed to meet management objectives.

Monitoring – Sites and facilities would be monitored twice per month for each month the area is accessible by the public. Monitoring would include visitor use, recreation caused resource effects or impacts, and visitor satisfaction.

### **Recreation Setting Characteristics:**

#### ***Physical Setting***

Level of:

Remoteness – Within 0.5 mile of primary roads.

Naturalness – Character of the natural landscape considerably modified.

Facilities – Modern facilities such as campgrounds and occasional exhibits.

#### ***Social Setting***

Level of:

Contacts – Usually 40 encounters/day on travel routes.

Group Size – 15-25 people/group.

Evidence of Use – A few large areas of alteration. Surface vegetation absent with hardened soils. Sounds of people frequently heard.

#### ***Administrative Setting***

Level of:

Motorized Use – Ordinary vehicle traffic is characteristic.

Visitor Services – Information materials plus experience and benefit descriptions.

Management Controls – Regulations strict on speed limits and use in campground and ethics signage prominent.

Recreation Activity Opportunities – Driving for pleasure, OHV hill climbing and driving.

### **Outcomes (Experience and Benefits):**

Experiences –

- Developing skills and abilities.
- Enjoying risk-taking adventure.
- Being around people I know and enjoy.

Personal Benefits –

- Improved physical fitness and health maintenance.
- More competitive spirit.
- Improved skills for outdoor enjoyment.

#### Community Benefits –

- Heightened sense of satisfaction with our community.
- More informed citizenry about where to go for different kinds of recreation experiences and benefits.

#### Environmental Benefits –

- Greater community ownership and stewardship of recreation and natural resources.
- Maintenance of distinctive recreation setting character.

#### Economic Benefits –

- Improved local economic stability.
- Increased local tourism.
- Greater value-added local services and industry.

### S.2.4 Continental Divide National Scenic Trail

Supporting information: The Continental Divide National Scenic Trail (CDNST) SRMA is made up of BLM-managed public lands in the northeast corner of the RSFO near the Continental Divide. Nine miles of the CDNST is located in the RSFO entering from the Lander Field Office and exiting into the Bridger Teton National Forest. A spur route is located between county road 4-74 along the north boundary of the Honeycomb Buttes Wilderness Study Area.

#### **Land Use Plan Management Actions/Allowable Uses and Implementation Actions:**

Management – The area includes dispersed recreation and camping areas. In areas where overnight camping is allowed, there is a 14-day camping limit.

Administration – The area would be managed as Visual Resource Management Class II within three miles or the visual horizon, whichever is closest. All motorized use would be limited to designated roads and trails. The area within one mile of the trail is a ROW avoidance area.

Information and Education – Signage and other visitor controls are installed and more would be added if needed to meet management objectives.

Monitoring – Sites and facilities would be monitored twice per month for each month the area is accessible by the public. Monitoring would include visitor use, recreation caused resource effects or impacts, and visitor satisfaction.

#### **Recreation Setting Characteristics:**

##### *Physical Setting*

Level of:

Remoteness – Within 0.5 mile of two track routes.

Naturalness – Natural landscape with modifications in harmony with surroundings and not visually obvious.

Facilities – Developed trails made mostly of native materials, structures are rare and isolated.

***Social Setting***

Level of:

Contacts – 7-15 encounters/day on travel routes.

Group Size – 4-6 people per group.

Evidence of Use – Areas of alteration uncommon. Little surface vegetation wear observed. Sounds of people infrequent.

***Administrative Setting***

Level of:

Motorized Use – Four-wheel drive vehicles, ATVs, and dirt bikes along the two track routes. Non-motorized mechanized use as well as pedestrian use along the 0.5 mile single track trail.

Visitor Services – Basic maps, staff infrequently present to provide onsite assistance.

Management Controls – Basic user regulations at key access points. Minimum use restrictions.

Recreation Activity Opportunities – Hiking, mountain biking, photography, and nature viewing.

**Outcomes (Experience and Benefits):**

Experiences -

- Enjoy going exploring on my/our own.
- Enjoy the closeness of family.
- Experiencing a greater sense of independence.
- Testing endurance.
- Enjoy risk taking adventure.

Personal Benefits –

- Improved mental well-being.
- Enhanced sense of personal freedom.
- Improved physical fitness and health maintenance.

Community Benefits –

- Greater household awareness of, and appreciation for our natural and cultural heritage.
- More informed citizenry about where to go for different kinds of recreation experiences and benefits.

Environmental Benefits –

- Greater community ownership and stewardship of recreation and natural resources.
- Increased awareness and protection of natural landscapes.

Economic Benefits –

- Enhanced ability for visitors to find areas providing wanted recreation experiences and benefits.
- Increased local tourism revenue.

- Improved local economic stability.

## S.2.5 Continental Divide Snow Machine Trail

Supporting information: The Continental Divide Snow Machine Trail (CDSMT) SRMA is made up of BLM-managed public lands in the northeast corner of the RSFO near the Continental Divide. Seven miles of the CDSMT is located in the RSFO entering from the Lander Field Office and exiting into the Bridger Teton National Forest.

### Land Use Plan Management Actions/Allowable Uses and Implementation Actions:

Management – The area includes developed camping areas and dispersed camping uses. In areas where overnight camping is allowed, there is a 14-day camping limit.

Administration – The area would be managed as Visual Resource Management Class II within three miles or the visual horizon, whichever is closest. All motorized use would be limited to designated roads and trails. Over the snow vehicle use is limited to areas where snow is a minimum of 8” deep. The area is a ROW avoidance area.

Information and Education – Signage and other visitor controls are installed and more would be added if needed to meet management objectives.

Monitoring – Sites and facilities would be monitored once per month for each month the area is accessible by the public. Monitoring would include visitor use, recreation caused resource effects or impacts, and visitor satisfaction.

### Setting Characteristics:

#### *Physical Setting*

Level of:

Remoteness – More than 0.5 mile from improved roads.

Naturalness – Natural landscapes with modifications in harmony with surroundings and not visually obvious.

Facilities – Developed trails mostly of native materials. Structures are rare and isolated.

#### *Social Setting*

Level of:

Contacts – 7-15 encounters/day.

Group Size – 4-6 people per group.

Evidence of Use – Areas of alteration uncommon. Little surface vegetation wear observed. Sounds of people infrequent.

#### *Administrative Setting*

Level of:

Motorized Use – Primary use is snow machines.

Visitor Services – Area brochures and maps, staff present only occasionally to provide onsite assistance.

Management Controls – Some regulatory and ethics signs. Moderate use restrictions.

Recreation Activity Opportunities – Hiking, snow machining, nature viewing, and skiing.

### **Outcomes (Experience and Benefits)**

Experiences –

- Enjoy going exploring on my/our own.
- Enjoy the closeness of family.
- Experiencing a greater sense of independence.
- Testing endurance.
- Enjoy risk taking adventure.

Personal Benefits –

- Improved mental well-being.
- Enhanced sense of personal freedom.
- Improved physical fitness and health maintenance.
- Greater family bonding.

Community Benefits –

- Heightened sense of satisfaction with our community.
- Greater community involvement in recreation and other land use decisions.

Environmental Benefits –

- Increased awareness and protection of natural landscapes.
- Greater retention of distinctive natural landscape features.

Economic Benefits –

- Greater value-added local services.
- Increased local job opportunities.
- Increased local tourism revenue.
- Improved local economic stability.

## **S.2.6 Oregon and Mormon Pioneer National Historic Trail**

Supporting information: The Oregon and Mormon Pioneer National Historic Trails SRMA is made up of BLM-managed public lands in the RSFO following four congressionally designated Historic Trails. These four trails cross through the RSFO in the area north of Interstate 80, and are the Oregon, California, Mormon Pioneer and Pony Express Trails.

### **Land Use Plan Management Actions/Allowable Uses and Implementation Actions:**

Management – The area includes the trails and a three-mile buffer on both sides. In areas where overnight camping is allowed, there is a 14-day camping limit.

Administration – The area would be managed as Visual Resource Management Class II within three miles or the visual horizon, whichever is closer. All motorized use is limited to designated roads and trails. The area within one mile of the trail is a ROW avoidance area.

Information and Education – Signage and other visitor controls are installed and more would be added if needed to meet management objectives.

Monitoring – Sites and facilities would be monitored twice per month for each month the area is accessible by the public. Monitoring would include visitor use, recreation caused resource effects or impacts, and visitor satisfaction.

**Recreation Setting Characteristics:**

***Physical Setting***

Level of:

Remoteness – Within 0.5mile of four-wheel drive two track routes.

Naturalness – Character of the natural landscape retained. A few modifications contrast with the character of the landscape.

Facilities – Maintained and marked trails, simple trailhead developments.

***Social Setting***

Level of:

Contacts – 15-29 encounters on travel routes.

Group Size – 7-12 people/group.

Evidence of Use – Small areas of alteration. Surface vegetation showing wear with some bare soils. Occasional sounds of people.

***Administrative Setting***

Level of:

Motorized Use – Four-wheel drive vehicles, ATVs and dirt bikes in addition to nonmotorized mechanized use.

Visitor Services – Area brochures and maps, staff occasionally present to provide onsite assistance.

Management Controls – Some regulatory and ethics signs. Moderate use restrictions.

Recreation Activity Opportunities – Hiking, mountain biking, photography, heritage tourism including wagon train and hand cart reenactment.

**Outcomes (Experience and Benefits):**

Experiences –

- Enjoy going exploring on my/our own.
- Enjoy the closeness of family.
- Experiencing a greater sense of independence.
- Testing endurance.
- Enjoy risk taking adventure.

Personal Benefits –

- Improved mental well-being.
- Enhanced sense of personal freedom.
- Improved physical fitness and health maintenance.
- Greater family bonding.

#### Community Benefits –

- Greater household awareness of and appreciation for our natural and cultural heritage.
- More informed citizenry about where to go for different kinds of recreation experiences and benefits.

#### Environmental Benefits –

- Greater protection of area historic structures and archaeological sites.
- Increased awareness and protection of natural landscapes.

#### Economic Benefits –

- More positive contributions to local-regional economy.
- Maintenance of community's distinctive recreation/tourism market niche or character.

## S.2.7 Red Creek Badlands

Supporting information: The Red Creek Badlands is rich in natural recreational resources with dramatic landscapes. Management objectives are to maintain the primitive to semi-primitive setting and wilderness characteristics, including the Red Creek WSA, wildlife, and wild horses which cater to primitive and semi-primitive recreational experiences.

### **Land Use Plan Management Actions/Allowable Uses and Implementation Actions:**

**Management** – The area includes dispersed camping and recreation areas. In areas where overnight camping is allowed, there is a 14-day camping limit.

**Administration** – The area would be managed as Visual Resource Management Class I in the Red Creek WSA and Classes II and III in all other areas. All motorized use would be limited to designated roads and trails. The area is a ROW avoidance area.

**Information and Education** – Signage and other visitor controls are installed and more would be added if needed to meet management objectives.

**Monitoring** – Sites and facilities would be monitored twice per month for each month the area is accessible by the public. Monitoring would include visitor use, recreation caused resource effects or impacts, and visitor satisfaction.

### **Recreation Setting Characteristics:**

#### *Physical Setting*

Level of:

**Remoteness** – More than 0.5 mile from motorized routes.

**Naturalness** – Undisturbed natural landscapes.



Facilities – No structures.

### ***Social Setting***

Level of:

Contacts – Fewer than 3-6 encounters/day in area and on travel routes.

Group Size – Fewer than or equal to 3 people/group.

Evidence of Use – No alterations of the natural terrain. Sounds of people are rare.

### ***Administrative Setting***

Level of:

Motorized Use – Four-wheel drive vehicles, ATVs, and dirt bikes in addition to nonmotorized mechanized use.

Visitor Services – No maps or brochures available onsite, and staff are rarely available.

Management controls – On site controls and services present at key access points, but subtle.

Recreation Activity Opportunities – Hiking, hunting, camping, mountain biking, and photography.

### **Outcomes (Experience and Benefits):**

Experiences –

- Enjoy going exploring on my/our own.
- Enjoy the closeness of family.
- Experiencing a greater sense of independence.
- Testing endurance.
- Enjoy risk taking adventure.

Personal Benefits –

- Improved mental well-being.
- Closer relationship with the natural world.
- Enhanced sense of personal freedom.
- Improved physical fitness and health maintenance.
- Greater family bonding.

Community Benefits –

- Greater community involvement in recreation and other land use decisions.
- Heightened sense of satisfaction with our community.

Environmental Benefits –

- Maintenance of distinctive recreation setting character.
- Greater community ownership and stewardship of recreation and natural resources.

Economic Benefits –

- More positive contributions to local-regional economy.
- Enhanced ability for visitors to find areas providing wanted recreation experiences and benefits.

## S.2.8 Little Mountain

Supporting information: Little Mountain is located south of Rock Springs, Wyoming. The Little Mountain area is a very popular destination for both local residents and out-of-region visitors. The area is abundant with a wide variety of wildlife and dramatic scenery. This SRMA is necessary to accommodate semi-primitive to middle country recreational experiences in a recreational resource rich environment.

### Land Use Plan Management Actions/Allowable Uses and Implementation Actions:

Management – The area includes dispersed recreation and camping areas. In areas where overnight camping is allowed, there is a 14-day camping limit.

Administration – The area would be managed as a Visual Resource Management Class II. All motorized use would be limited to designated roads and trails. The area is a ROW avoidance area. A withdrawal from appropriation under the mining laws will be pursued.

Information and Education – Signage and other visitor controls are installed and more would be added if needed to meet management objectives.

Monitoring – Sites and facilities would be monitored twice per month for each month the area is accessible by the public. Monitoring would include visitor use, recreation caused resource effects or impacts, and visitor satisfaction.

### Recreation Setting Characteristics:

#### *Physical Setting*

Level of:

Remoteness – Within 0.5 mile of mechanized trails/routes.

Naturalness – Natural landscape with modification in harmony with surroundings and not visually obvious.

Facilities – Structures are rare and isolated.

#### *Social Setting*

Level of:

Contacts – 7-15 encounters/day on travel routes.

Group Size – 4-6 people/group.

Evidence of Use – Areas of alteration uncommon. Little surface vegetation wear observed, sounds of people infrequent.

#### *Administrative Setting*

Level of:

Motorized Use – Four-wheel drive vehicles, ATVs, dirt bikes, or snowmobiles in addition to non-motorized mechanized use.

Visitor Services – Basic maps, staff infrequently present to provide onsite assistance.

Management Controls – Basic user regulations at key access points. Minimum use restrictions.

Recreation Activity Opportunities – Hiking, hunting, wildlife photography, and sightseeing.

**Outcomes (Experience and Benefits):**

Experiences –

- Savoring the total sensory – sight, sound, and smell – experience of a natural landscape.
- Feeling good about solitude.
- Being isolated and independent.
- Enjoy having easy access to natural landscapes.

Personal Benefits –

- Closer relationship with the natural world.
- Improved mental well-being.

Community Benefits –

- Heightened sense of satisfaction with our community.
- Greater community involvement in recreation and other land use decisions.

Environmental Benefits –

- Maintenance of distinctive recreation setting character.
- Greater community ownership and stewardship of recreation and natural resources.

Economic Benefits –

- Enhanced ability for visitors to find areas providing wanted recreation experiences and benefits.
- Increased desirability as a place to live or retire.

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# APPENDIX T—CUMULATIVE AND OTHER IMPACTS

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## T.1 CUMULATIVE IMPACTS

This section defines cumulative impacts, describes the methodology used for assessing these impacts, describes projects and activities considered in this assessment, and presents the results organized by resource topic.

Cumulative impacts are the effects on the environment that result from implementing any of the alternatives in combination with other actions outside the scope of the plan revision, either within the planning area or outside it. The Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) define cumulative impacts as:

*“The impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” (40 Code of Federal Regulations [CFR] §1508.7).*

The real effect of any single action cannot be determined by considering that action in isolation but must be determined by considering the likely result of that action in conjunction with many others. The cumulative impact analysis for the draft Resource Management Plan (RMP) and Environmental Impact Statement (EIS) evaluates the potential impacts associated with the management alternatives in combination with the potential impacts associated with other relevant activities that have occurred, are occurring, or are likely to occur in the vicinity of the planning area.

### T.1.1 Cumulative Analysis Methodology

Land use planning is the Bureau of Land Management’s (BLM) broadest level of decision making. BLM planning-level decisions are programmatic decisions that allocate resources or specify allowable uses in all or portions of the planning area to emphasize certain management direction. Site-specific actions are rarely addressed in an RMP. As a result, the cumulative impact analysis is also broad and general in nature. It will present ranges and qualitative conclusions as opposed to bounded quantified details. These cumulative impacts will then be considered in subsequent NEPA documents that analyze specific projects or programs. Examples include oil and gas field development plans, livestock grazing allotment management plans (AMP), and individual authorizations such as rights-of-way (ROW) or special recreation permits.

Analysis and description of the identifiable effects of past actions are required to the extent they are relevant and useful in analyzing whether the reasonably foreseeable effects of the alternatives may have a continuing, additive, and significant relationship to those present effects. Based on scoping, agencies have discretion on what is useful concerning past action for the agency’s analysis of the effects of present action and its reasonable alternatives. Effects of past actions and activities on resources are manifested in the current condition of the resource, which is described in Chapter 3 (Affected Environment) for resources on lands administered by the BLM within the planning area. Specific information presented in Chapter 3 is not repeated here.

Effects of past actions and activities on resources are manifested in the current condition of the resource, which is described in Chapter 3 (Affected Environment) for resources on lands administered by the BLM within the planning area. The cumulative impact analysis is based on numerous assumptions and projections about future actions and their effects. Detailed information about specific future actions may be unavailable.

General terms such as low, moderate, and high are used to describe the intensity of effects. The cumulative impact analysis also compares the relative intensity of effects between alternatives.

This analysis focuses on RMP actions that, when combined with other past, present, and reasonably foreseeable future actions, would collectively be significant. Not all issues identified for director indirect impact assessment in the RMP are analyzed for cumulative effects. Because of the wide geographic scope of a cumulative impact assessment and the variety of activities assessed, cumulative impacts are commonly examined at a more qualitative and less detailed level than are direct and indirect impacts.

Public documents prepared by federal, state, and local government agencies are the primary sources of information regarding past, present, and future actions considered in the cumulative effects analysis. Actions undertaken by private persons and entities are assumed to be captured in the information made available by such agencies. Speculative or uncommitted projects are not included in the projections. These projections are not planning decisions. Using them in this analysis does not constitute approval by the BLM, or any authorizing agency. These projections do not set a limit or cap on future BLM actions. Unforeseen changes in such factors as economics; public demand; and federal, state, and local laws and policies could result in different outcomes than those projected for this analysis.

Potential cumulative impacts are described for each affected resource within a defined cumulative impact analysis area (CIAA). The CIAA covers different geographic areas depending on the specific resource being evaluated. The CIAAs are described in each of the resource sections below. CIAAs that extend beyond the planning area are largely for resources that are mobile or migrate, compared to resources that are stationary. For example, the air quality CIAA is large because it is based on the complex interaction between climatic factors, terrain, and the potential for significant impacts to occur in sensitive areas within the airshed. Smaller CIAAs were established for resources that are stationary such as cultural resources, minerals, and visual resources. In some cases, these CIAAs might be the same as the planning area boundary. Activities and development that occur within or outside the CIAAs have the potential to create cumulative impacts on the specific resource being analyzed.

The BLM considered the following factors in this cumulative impact assessment:

- Federal, nonfederal, and private actions
- The potential for effects to cross political and administrative boundaries
- Other spatial and temporal characteristics of each affected resource
- The comparative scale of cumulative impacts across alternatives
- Scoping comments.

Temporal and spatial boundaries used in the cumulative analysis are developed on the basis of resources of concern and actions that might contribute to an impact. The baseline date for the cumulative impacts analysis is 2017. The temporal scope of this analysis is a 20-year planning horizon. Land use planning documents are generally evaluated on a 5-year cycle.

Spatial boundaries vary and are larger for resources that are mobile or migrate (e.g., migratory birds) compared with stationary resources. Occasionally, spatial boundaries could be contained within the planning area boundaries or an area within the planning area. Spatial boundaries were developed to facilitate the analysis and are included under the appropriate resource section heading. The cumulative effects analysis for all topics included an analysis of cumulative effects at the planning area level.

## T.1.2 Projects and Activities Considered

The following activities were identified as having the greatest likelihood to generate potential cumulative impacts when added to activities associated with the Rock Springs RMP alternatives:

- BLM and Forest Service land management plans and activities in adjacent planning areas
- Regional oil and gas development activities (e.g., exploration, production, and pipeline development)
- Regional recreation activities (e.g., hunting, off-highway vehicle (OHV) use, dispersed recreation)
- Economic development activities in Lincoln, Sweetwater, Uinta, Sublette, and Fremont Counties.

Activities and development that occur within the CIAAs have the potential to create cumulative impacts on the specific resource being analyzed. Oil and gas development presents the highest likelihood for impacts within the planning area and in southwest Wyoming as a whole. Anticipated oil and gas projects within the planning area are encompassed by the oil and gas reasonable foreseeable development (RFD) for the planning area. Mineral development and other actions that would create the potential for cumulative impacts are listed in Table T-1 and Table T-2. The projects listed in Table T-2 are not presented as an exhaustive list of actions, but every effort has been made to present a representative list of actions that could contribute to cumulative impacts.

**Table T-1. Summary of Oil and Gas Reasonable Foreseeable Development for Public Lands and Mineral Estate in Southwestern Wyoming**

Planning Area	Existing Wells	Public Land and Mineral Estate RFD	Private and State Lands RFD	Total Oil and Gas RFD	Total Potential Wells (existing plus RFD)
Kemmerer Field Office	1,562	1,221	1,459	2,680	4,242
Pinedale Field Office	2,970	7,804	1,247	9,051	12,021
Rawlins Field Office	3,450	4,087	5,111	9,198	12,648
Rock Springs Field Office	6,095	4,648	1,087	5,735	11,830
<b>Total</b>	<b>14,077</b>	<b>17,760</b>	<b>8,904</b>	<b>26,664</b>	<b>40,741</b>

**Table T-2. Summary of Other Activities Considered**

Project Title	Project Description
Big Sandy Rock Sill	Provides artificial habitat for increasing fish populations in the Big Sandy River. On-ground project activity on-going.
Bird Canyon Field Natural Gas Development (EIS)	Crown Energy and Koch Exploration Company are proposing new development in the existing Bird Canyon Field. Development consists of up to 371 new wells (234-Crown, 137-Koch) over 6-12 years with associated road development. The proposal is currently on hold.

Project Title	Project Description
Bitter Creek Shallow Oil and Gas Project	The project proposes to drill a maximum of 61 wells with an estimated 326 acres of total surface disturbance. The total project area encompasses approximately 17,961 acres: 11,768 acres are federal surface and minerals and 6,193 acres are private surface and minerals. The environmental assessment (EA) was completed in 2005. On-ground project activity on-going.
Black Butte Coal Lease Modification	Project proposed to expand surface mining operations by about 450 acres of federal coal lands. NEPA complete. On-ground project activity on-going.
BLM Wild Horse Gathers	BLM wild horse gathers from herd management areas (HMA) within the five HMAs in the Rock Springs Field Office (RSFO) and adjacent BLM offices.
Big Firehole Canyon Fuel Treatment Project	The project proposes to conduct fuel treatments on 400 acres. On-ground project activity on-going.
Browns Spring Fuel Treatment Project	The project conducted fuel treatments on 250 acres in 2011.
Copper Ridge Shallow Gas Exploration and Development Pilot Project	The proposal involves drilling, completing, and operating a maximum of 89 shallow gas wells and related production and water disposal facilities in the Copper Ridge Project Area. The project area includes a total of 24,953 acres. The Copper Ridge Project Area overlies an area already developed by two existing oil and gas projects; the Brady and the Jackknife Springs Fields. The EA was completed in 2003. On-ground project activity on-going.
Desolation Road Unit Development	The project includes gas resource exploration and development to include development of up to 17 wells from five well pads in two phases. Phase 1 would be to drill two exploratory gas wells from two well pads. If successful, Phase 2 would be to drill up to 15 wells from those two pads, add three more well pads and construct the associated access roads and pipelines. Project withdrawn 2021.
FMC Grange Optimization Project	Enhance solution mining capabilities at FMC Granger. NEPA in progress.
Green River RMP	Comprehensive land use plan (LUP) focuses on similar resource issues and management to the south of the planning area. Green River RMP manages portions of the Pinedale planning area CIAAs for air, cultural, forestry, recreation, vegetation, visual resource management (VRM), watersheds, and wildlife habitat management. On-ground project activity on-going.
Henry's Fork Colorado River Salinity Project	The Natural Resources Conservation Service (NRCS) has developed this plan and EIS to reduce 6,540 tons of annual salt loading to the Colorado River system by implementing conservation practices in the upper Henrys Fork project area. NEPA complete. On-ground project activity on-going.
Hiawatha EIS	The Operators propose to drill as many as 4,208 new wells within the project area, which represents a full development scenario. Project withdrawn 2019.
Industrial Plant shut downs and overhauls	On a yearly basis, many of the Industrial Plants shut down a portion of their operations for overhauls. These shut downs collectively can bring annually hundreds of workers into the County.
Jim Bridger Coal Lease	Leases modified in July 2011 and May 2013, totaling 2,562.54 acres. NEPA documents complete. On-ground project activity on-going.
Jim Bridger Power Plant	Retrofits to power plant units to accommodate Environmental Protection Agency (EPA) haze rules.
Jim Bridger South Wind Project	Wind project; Type II status in 2011. Project closed 2015.
Kinney Rim Wind Project	Wind project; Type II status in 2011. Project closed 2016.

Project Title	Project Description
LaBarge Platform Exploration and Development (EIS)	The Pinedale and Rock Springs Field Offices developing an EIS for the La Barge Platform Project for 838 new natural gas and oil wells from 463 new well pads (vertical and horizontal) over a 40-year project lifespan. Drilling expected to occur over a 10-year period in the Upper Green River Basin, in Sublette and Lincoln counties in western Wyoming. The project area consists of 218,000 acres of federal, state, and private lands. The area is one of the oldest oil and gas fields in the region, dating back roughly 100 years. Project withdrawn in 2015.
Little Monument Natural Gas Project	Burlington proposes to drill, complete, and produce approximately 31 additional wells at eight or more wells per section within the Little Monument project area over the next three years. The EA was completed in 2004. On-ground project activity on-going.
Little Red Creek Fuel Treatment Project	The project conducted 400 acres of fuel treatments in 2010. On-ground project activity on-going.
Luman Rim EA	The proposed action is to drill 58 additional natural gas wells in the Luman Rim area of north central Sweetwater County, Wyoming. The EA was completed in 12/2010. On-ground project activity on-going.
Monell Arch Development EA	Proposal submitted by Anadarko Petroleum Corporation to infill drill additional oil and gas wells in the Monell and Arch Units to facilitate product extraction, maximize the economic recovery of the resource, and extend the production life of the units. The Monell Arch area is located in southwestern Wyoming, and is comprised of 22,657 acres of mixed federal, state and private surface lands and 22,658 acres of mixed federal and state mineral lands in Sweetwater County. The operator has proposed approximately 105 new oil wells, 18 CO <sub>2</sub> injector wells and two water injection wells that would be drilled within the project area. On-ground project activity on-going.
Monell Enhanced Oil Recovery Project	Anadarko proposes to drill a maximum of 126 wells. The EA was completed in 2005. Drilling began in 2006 and was planned for approximately three to six years. On-ground project activity on-going.
North Dutch John Unit #1 Well	A new oil or gas well proposal inside the North Dutch John Unit in Sweetwater County, Wyoming. An associated access road, two-track upgrade and well pad is also included in with this analysis, with a total proposed disturbance of 10.4 acres. Project withdrawn 2020.
NPL (Normally Pressured Lance) Project	The NPL Project Area, located about 68 miles northwest of Rock Springs, Wyoming, covers approximately 141,000 acres administered by the BLM Pinedale Field Office and RSFO. For all project components, the estimated total initial surface disturbance is estimated to be about 6,625 acres, or 4.7% of the NPL surface acreage. Up to 3,500 new wells would be drilled over a ten-year period starting in March 2013 at an average rate of up to 350 wells per year.  Outside of the sage-grouse core area, drilling would occur on an average of four centralized, multi-well pads per section. Inside the sage-grouse core area, drilling would take place from one multi-well pad per 640-acre area (not section). Each multi-well drilling and completion pad would encompass up to approximately 18 acres per location and would support between 1 and 64 wells. Record of Decision issued August 2018.
Pacific Rim Shallow Gas Exploration and Development Project	Project proposes to drill a maximum of 120 wells. The EA was completed in 2004. On-ground project activity on-going.
Pit 14 Coal Lease	1,399 acres leased for coal development. The EIS was completed in 2007. On-ground project activity on-going.



Project Title	Project Description
Puma Deep Prospect Area Gas Development Project	Davis Petroleum Corporation proposes to construct, drill, and complete 10 wells in addition to the five already existing wells on the 8,800-acre federally-administered minerals. The EA was completed in 2009. On-ground project activity on-going.
Riley Ridge to Natrona Pipeline	The Riley Ridge to Natrona proposal is to construct pipelines of various sizes along a 243-mile linear ROW through Fremont, Sublette, Sweetwater and Natrona counties. Other construction activities include the Riley Ridge Sweetening Plant, access roads, power lines, injection wells, and power line. Project completed 2019.
Rock Springs RMP Revision (EIS)	Revise Green River RMP.
Simplot - Reliability Project	Expansion to increase plant capacity.
Sweeney Ranch Wind Project	The project involves constructing a wind development project with a maximum of 119 wind turbine generators within the RSFO boundary. Wildlife surveys were initiated in 2010/2011. Project closed 2015.
Sweetwater Solar Energy Project	The project proposes construction of a solar generation project approximately 11 miles northwest of the City of Green River: Photovoltaic collecting arrays, perimeter roads, buried electrical collection lines, an operation and maintenance facility and overhead electrical power line. The Project encompasses approximately 703 acres of which 640 acres are managed by the BLM. Project completed 2018.
Ten Mile Rim Coal Lease	Coal lease on the Ten Mile Rim Tract (WYW-154595); includes 2,242.18 acres of federal coal lands. The EA was completed in 2004. Coal production on-going.
Vermillion Basin Natural Gas Exploratory and Development Project	Proposal to drill up to 56 natural gas wells in and around three existing, producing oil and gas units (Trail, Kinney Rim, and Canyon Creek). The EA was completed in 2002. On-ground project activity on-going.

## T.1.3 Cumulative Impacts by Resource

### Air Quality

#### Greenhouse Gases and Climate Change

Concentrations of certain gases in the earth's atmosphere have been identified as being effective at trapping heat reflected off the earth's surface thereby creating a "greenhouse effect." As concentrations of these greenhouse gases increase, the earth's surface warms, the composition of the atmosphere changes, and global climate is affected. Concentrations of greenhouse gases have increased dramatically in the earth's atmosphere in the past century. Anthropogenic (man-made) sources and human activities have been attributed to these increases particularly for CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, and fluorinated gases (EPA 2018d).

This Air Quality Technical Support Document is presented in Appendix P and describes the processes used to conduct the air quality impact assessment and provides summaries of relevant analysis data. Table T-3 shows the total federal direct and indirect GHG emissions across all alternatives for oil and gas over the 20-year analysis period. As mentioned in Section 4.3.4, Alternative C has the potential to emit the most direct GHG emissions while Alternative B direct GHG emissions are the least of all alternatives. Alternative B most closely aligns with the DOI's climate change priorities among all alternatives.

**Table T-3 Total Federal Direct and Indirect Oil and Gas GHG Emissions (MT)**

Alternative	End-Use/Indirect Oil and Gas Emissions			Sum of Direct and Indirect Oil and Gas Emissions		
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O
A	310,991,900	11,569	892	366,901,300	578,495	1,657
B	181,625,860	6,719	519	213,133,065	336,806	955
C	315,829,639	11,678	902	372,645,808	588,054	1,680
D	308,401,354	11,520	887	363,863,661	573,587	1,645

Table T-4 presents not only all non-oil and gas direct and indirect GHG emissions but also the grand total of all direct and indirect GHG emissions from BLM-authorized activities over the 20-year analysis period. Appendix R-Air Quality Adaptive Management Strategy Section R.5.9 provides a list of best management practices for oil and gas development (which constitute the largest proportion of total anticipated emissions) that address both air quality and GHG emissions reductions.

**Table T-4 Non-Oil and Gas Direct and Indirect Emissions and Sum of All Direct and Indirect GHG Emissions from BLM-Authorized Activities (MT)**

Alternative	Sum of Direct and Indirect Emissions from Non-Oil and Gas Activities			Grand Total for Direct and Indirect GHG Emissions from All BLM-Authorized Activities		
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O
A	24,298,362	226,717	378	391,199,662	805,213	2,035
B	24,264,316	64,548	47	237,397,380	401,354	1,002
C	24,373,117	235,863	1,704	397,018,926	823,917	3,383
D	24,298,362	226,717	378	388,162,022	800,305	2,024

The EPA has determined that six greenhouse gases are air pollutants and subject to regulation under The Clean Air Act (CAA): CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (EPA 2013). Of these greenhouse gases, CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O are commonly emitted by the types of activities included in this analysis, while the remaining three greenhouse gases are emitted in extremely small quantities or are not emitted at all. Greenhouse gas emissions from management actions and activities were estimated for each alternative in this analysis for CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O.

A greenhouse gases' ability to contribute to global warming is based on its longevity in the atmosphere and its heat-trapping capacity. In order to aggregate greenhouse gas emissions and assess their contribution to climate change, the EPA has assigned each greenhouse gas a global warming potential (GWP) that is used to calculate CO<sub>2</sub> equivalents. Under all of the alternatives, a variety of activities in the planning area would generate greenhouse gas emissions, including CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O. These activities include oil and gas and other minerals development (primarily coal and trona mining), fire events, motorized vehicle use, livestock grazing, facilities development, and other surface-disturbing activities. Since the Industrial Revolution, atmospheric concentrations of CO<sub>2</sub> have risen more than 40% and continues to rise at a rate about 0.4% per year (IPCC 2013), principally due to the combustion of fossil fuels. Fossil fuel combustion accounted for 93.5% of national CO<sub>2</sub> emissions in 2016 (EPA 2018a). CH<sub>4</sub> is more than 28 times as effective as CO<sub>2</sub> at trapping heat in the atmosphere and accounts for 28 times more greenhouse gas for the GWP over 100 years and 84 in greenhouse gas for the GWP for 20 years (IPCC 2014) and accounted for about 10% of greenhouse gas emissions in 2016 (EPA 2018b). N<sub>2</sub>O is 265 times as effective as CO<sub>2</sub> at trapping heat in the atmosphere and accounts for 265 times more greenhouse gas for the GWP over 100 years and 264 in greenhouse gas for the GWP for 20 years (IPCC 2014) and accounted for about 6% of greenhouse gas emissions in 2016.

(EPA 2018c). CO<sub>2</sub> equivalent is a measurement that allows an aggregate comparison of multiple greenhouse gases (e.g., CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O), created by multiplying the actual or anticipated emissions of each gas by its relative GWP. Therefore, the GWPs used for greenhouse gas emission calculations and reporting for the Rock Springs planning area for 100 years are CO<sub>2</sub> = 1, CH<sub>4</sub> = 28, and N<sub>2</sub>O = 265 and for 20 years are CO<sub>2</sub> = 1, CH<sub>4</sub> = 84, and N<sub>2</sub>O = 264. Table T-5 shows the estimated annual emissions of the greenhouse gases for each alternative in year 1, year 10, and year 20.

**Table T-5. Total Estimated Greenhouse Gas Emissions Summary for Bureau of Land Management Activities in the Rock Springs Planning Area (Tons or Metric Tonnes)**

Scenario	CO <sub>2</sub> (tons)	CH <sub>4</sub> (tons)	N <sub>2</sub> O (tons)	CO <sub>2</sub> eq tons (100 Year)	CO <sub>2</sub> eq metric tonnes (100 Year)*	CO <sub>2</sub> eq tons (20 Year)**
Alternative A - Year 1	1,792,764	26,021	39	3,476,501	3,153,829	4,083,849
Alternative B - Year 1	1,564,352	16,782	20	2,984,314	2,707,325	3,074,262
Alternative C - Year 1	1,807,623	26,560	106	3,524,047	3,196,962	4,161,517
Alternative D - Year 1	1,790,750	26,013	39	3,474,249	3,151,786	4,081,131
Alternative A - Year 10	2,981,005	38,933	56	5,030,699	3,706,757	6,361,095
Alternative B - Year 10	1,824,372	19,671	24	3,326,211	3,017,488	3,577,975
Alternative C - Year 10	3,036,206	40,017	123	5,133,982	4,657,471	6,525,008
Alternative D - Year 10	2,971,247	38,937	56	5,020,997	4,554,973	6,351,589
Alternative A - Year 20	4,279,554	52,984	74	6,727,520	6,103,105	8,844,778
Alternative B - Year 20	2,097,511	22,633	28	3,683,300	3,341,435	4,100,930
Alternative C - Year 20	4,380,881	54,693	142	6,894,592	6,254,671	9,107,486
Alternative D - Year 20	4,260,853	52,955	74	6,707,907	6,085,313	8,823,508

\*GWP-100 yr CH<sub>4</sub> = 28, N<sub>2</sub>O = 265

\*\* GWP-20 yr CH<sub>4</sub> = 84, N<sub>2</sub>O = 264

According to the Intergovernmental Panel on Climate Change (IPCC), “Emission metrics facilitate multi-component climate policies by allowing emissions of different greenhouse gases and other climate forcing agents to be expressed in a common unit (so-called ‘CO<sub>2</sub>-equivalent emissions’). The GWP was introduced in the IPCC First Assessment Report, where it was also used to illustrate the difficulties in comparing components with differing physical properties using a single metric. The 100-year GWP (GWP100) was adopted by the United Nations Framework Convention on Climate Change and its Kyoto Protocol and is now used widely as the default metric. It is only one of several possible emission metrics and time horizons. {WGI 8.7, WGIII 3.9} The choice of emission metric and time horizon depends on type of application and policy context; hence, no single metric is optimal for all policy goals. All metrics have shortcomings, and choices contain value judgments, such as the climate effect considered and the weighting of effects over time (which explicitly or implicitly discounts impacts over time), the climate policy goal and the degree to which metrics incorporate economic or only physical considerations. There are significant uncertainties related to metrics, and the magnitudes of the uncertainties differ across metric type and time horizon. In general, the uncertainty increases for metrics along the cause–effect chain from emission to effects. {WGI 8.7, WGIII 3.9}.” (IPCC 2014)

Typical sources contributing to potential cumulative impacts on air quality would include emissions from conventional oil and gas development, vehicle operations associated with mining activities, and general vehicular activity. Overall, air quality in the Rock Springs planning area is good, with the exception of

ozone. Sweetwater County is currently in nonattainment for both the National Ambient Air Quality Standard (NAAQS) and the Wyoming Ambient Air Quality Standard (WAAQS) for ozone. Some concentrated emission sources may have health impacts to certain local residents due to the level of potential ozone, such as a large plant or mine. Increases in population would likely bring more development and the potential for more emission sources that could degrade air quality in the planning area.

BLM and non-BLM reasonably foreseeable actions are anticipated to increase emissions in the planning area over the life of the plan. For the planning area, the cumulative air quality impacts (as measured against NAAQS and WAAQS) are anticipated to have the same intensity on BLM and non-BLM administered lands because it is assumed the density of activities are the same in both areas. This conclusion also assumes that cumulative impacts to air quality are equally distributed across the planning area. Because of proposed development restrictions on BLM administered land, the potential for adverse cumulative impacts to air quality are anticipated to be the least under Alternative B, which places the greatest restrictions on resource uses and management actions that contribute emissions, followed by Alternatives D, A, and C. Cumulative emissions are projected to be highest under Alternative C due to fewer proposed development restrictions on BLM administered land. Cumulative emissions within the Planning Area are not anticipated to result in air quality impacts that exceed NAAQS or WAAQS given the rather small amount of emissions from the BLM and other activities.

Estimated future BLM and non-BLM emissions are accounted for in the air quality cumulative emissions analysis. The 2014 Wyoming statewide emissions, which were obtained from the 2014 National Emissions Inventory (NEI) Data (EPA, 2014), were used in this analysis as a comparison. The long-year (year 20) has the largest impact to air quality emissions and therefore was used for the cumulative analysis, as all other years (year 1 and year 10) would have less impact. For each Alternative BLM activities and non-BLM activities (from oil, gas, and coal mining) which occur within the RSFO planning area were reviewed and compared to the 2014 Wyoming statewide estimated emissions (obtained from the 2014 NEI). Specific assumptions include:

- The cumulative impacts from non-BLM mineral actions (oil, gas, and coalbed natural gas [CBNG]) are based on the percent BLM vs. non-BLM mineral estate in the planning area.
- For cumulative impacts associated with other activities (i.e., non-oil and gas), the amount and density of activities is assumed to be the same for both BLM and non-BLM actions.
- Statewide emissions were obtained from the most recent EPA NEI data available from 2014.

Table T-6 shows criteria pollutant and hazardous air pollutants (HAP) emissions from BLM and non-BLM sources. Figure T-1, Figure T-2, Figure T-3, and Figure T-4 show the long year emissions from BLM and non-BLM sources in the planning area under Alternatives A, B, C, and D, respectively.

**Table T-6. Comparison of Emissions from Bureau of Land Management and Non-Bureau of Land Management Activities in the Rock Springs Planning Area to Cumulative Annual Statewide Emissions for 2014**

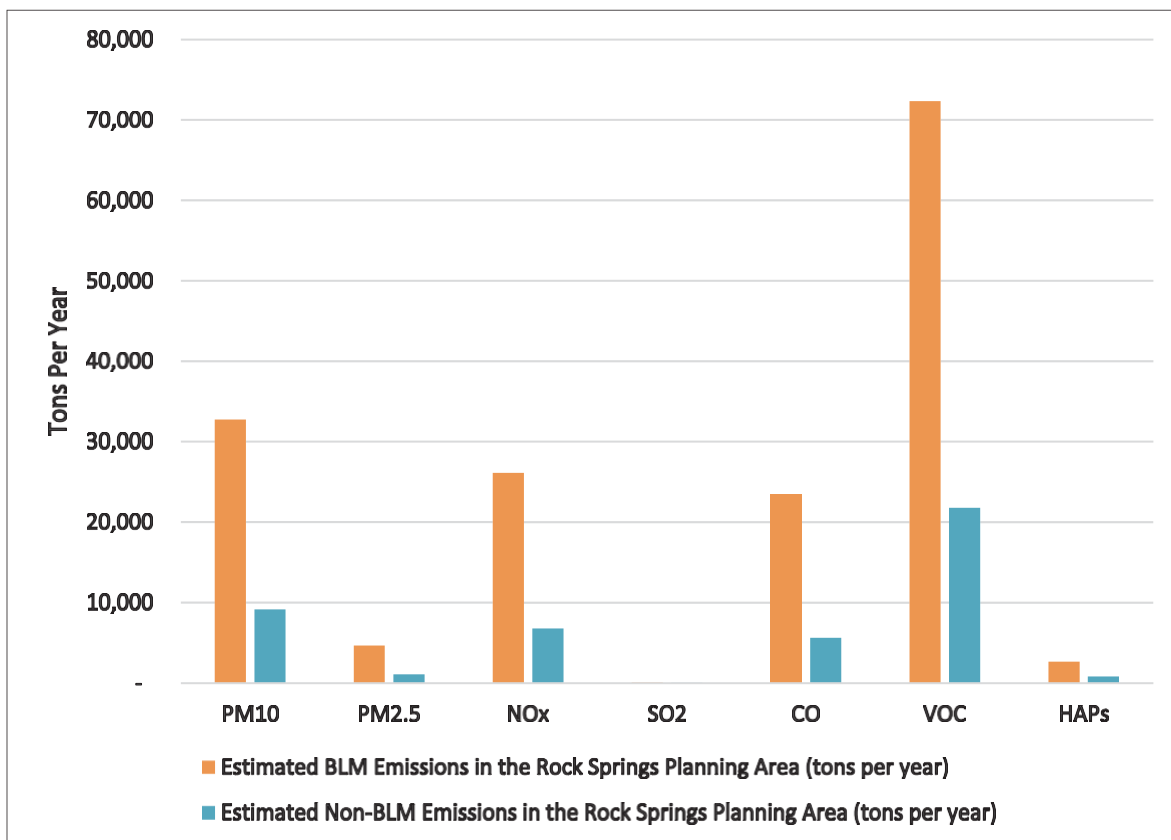
Pollutant	Estimated BLM Emissions in the Rock Springs Planning Area (tons per year)	Estimated Non-BLM Emissions in the Rock Springs Planning Area (tons per year)	2014 Wyoming Statewide Emissions (tons per year)	Total Tons per year	% Contribution of Actions within the Rock Springs Planning Area Emission to Statewide Emissions
<b>Alternative A - Long Year (Year 20)</b>					
PM <sub>10</sub>	32,759	9,135	195,603	237,498	17.64%
PM <sub>2.5</sub>	4,663	1,077	38,495	45,415	12.98%
NO <sub>x</sub>	26,126	6,779	177,330	210,235	15.65%
SO <sub>2</sub>	50	7	56,772	56,830	0.10%
CO	23,454	5,609	411,274	440,337	6.60%
VOC	72,334	21,782	814,311	908,427	10.36%
HAPs	2,659	812	81,431	84,902	4.09%
<b>Alternative B - Long Year (Year 20)</b>					
PM <sub>10</sub>	19,633	9,658	195,603	224,894	13.02%
PM <sub>2.5</sub>	2,898	1,157	38,495	42,550	9.53%
NO <sub>x</sub>	13,931	6,772	177,330	198,033	10.45%
SO <sub>2</sub>	21	7	56,772	56,800	0.05%
CO	11,777	5,597	411,274	428,648	4.05%
VOC	33,998	21,754	814,311	870,063	6.41%
HAPs	1,278	810	81,431	83,520	2.50%
<b>Alternative C - Long Year (Year 20)</b>					
PM <sub>10</sub>	35,066	9,510	195,603	240,178	18.56%
PM <sub>2.5</sub>	5,567	1,116	38,495	45,178	14.79%
NO <sub>x</sub>	26,937	6,849	177,330	211,117	16.00%
SO <sub>2</sub>	117	7	56,772	56,896	0.22%
CO	32,594	5,694	411,274	449,563	8.52%
VOC	74,347	21,971	814,311	910,629	10.58%
HAPs	2,773	824	81,431	85,028	4.23%
<b>Alternative D - Long Year (Year 20)</b>					
PM <sub>10</sub>	33,162	9,522	195,603	238,287	17.91%
PM <sub>2.5</sub>	4,701	1,118	38,495	44,314	13.13%

Pollutant	Estimated BLM Emissions in the Rock Springs Planning Area (tons per year)	Estimated Non-BLM Emissions in the Rock Springs Planning Area (tons per year)	2014 Wyoming Statewide Emissions (tons per year)	Total Tons per year	% Contribution of Actions within the Rock Springs Planning Area Emission to Statewide Emissions
NO <sub>x</sub>	26,024	6,849	177,330	210,203	15.64%
SO <sub>2</sub>	50	7	56,772	56,830	0.10%
CO	23,415	5,694	411,274	440,383	6.61%
VOC	71,912	21,971	814,311	908,194	10.34%
HAPs	2,652	824	81,431	84,908	4.09%

### Alternative A

Criteria air pollutant and HAPs, emissions from BLM managed source emissions would be more than non-BLM managed source emissions, however would be less than the 2014 Wyoming statewide emissions in the planning area. Table T-6 shows criteria pollutant and HAP emissions from estimated BLM and non-BLM sources against the Wyoming statewide emissions inventory. PM<sub>10</sub> is the largest percentage of emissions contribution within the Rock Springs planning area with 17% of the total emissions contributed by activities on BLM land, whereas SO<sub>2</sub> is the lowest percentage at 0.1%. Figure T-1 shows the long-year emissions from BLM and non-BLM sources in the planning area under Alternative A.

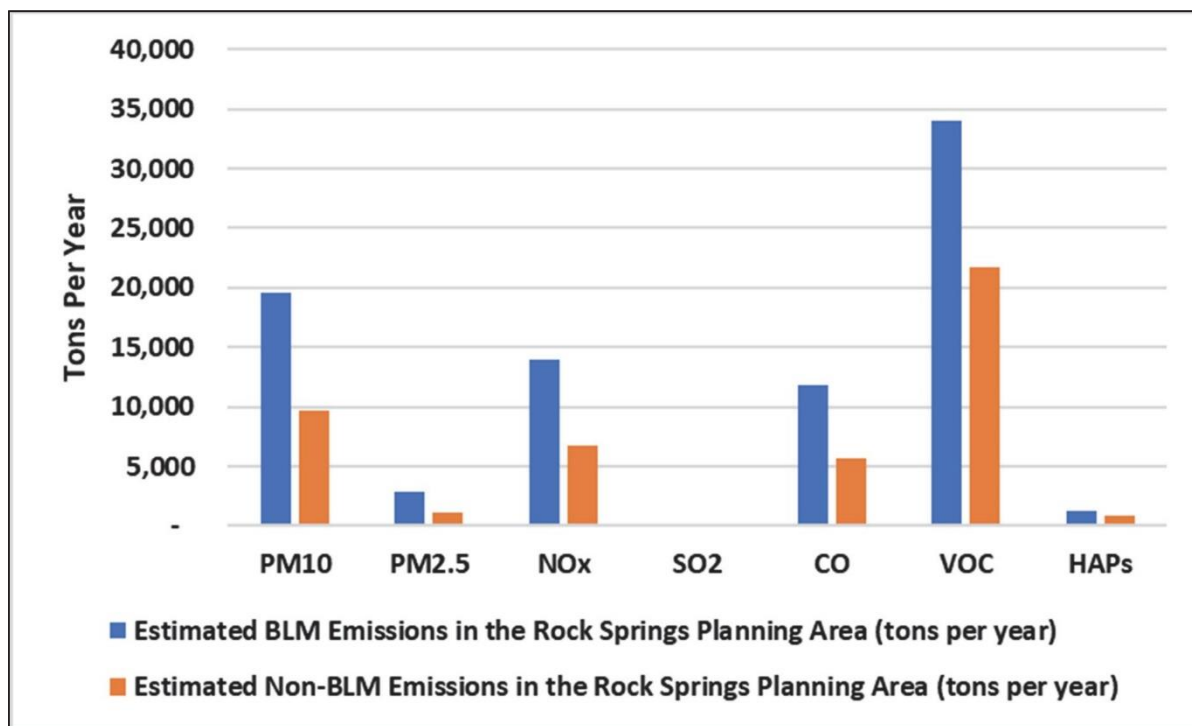
**Figure T-1. Long Year Emissions from Bureau of Land Management and Non-Bureau of Land Management Sources in the Planning Area under Alternative A**



**Alternative B**

Alternative B has the smallest cumulative impact with emissions from BLM managed source emissions would be more than non-BLM managed source emissions, however would be less than the 2014 Wyoming statewide emissions in the planning area. Table T-6 shows criteria pollutant and HAP emissions from estimated BLM and non-BLM sources against the Wyoming statewide emissions inventory. PM<sub>10</sub> is the largest percentage of emissions contribution within the Rock Springs planning area with 13% of the total emissions contributed by activities on BLM land, whereas SO<sub>2</sub> is the lowest percentage at 0.05%. Figure T-2 shows the long-year emissions from BLM and non-BLM sources in the planning area under Alternative B.

**Figure T-2. Long Year Emissions from Bureau of Land Management and Non-Bureau of Land Management Sources in the Planning Area under Alternative B**

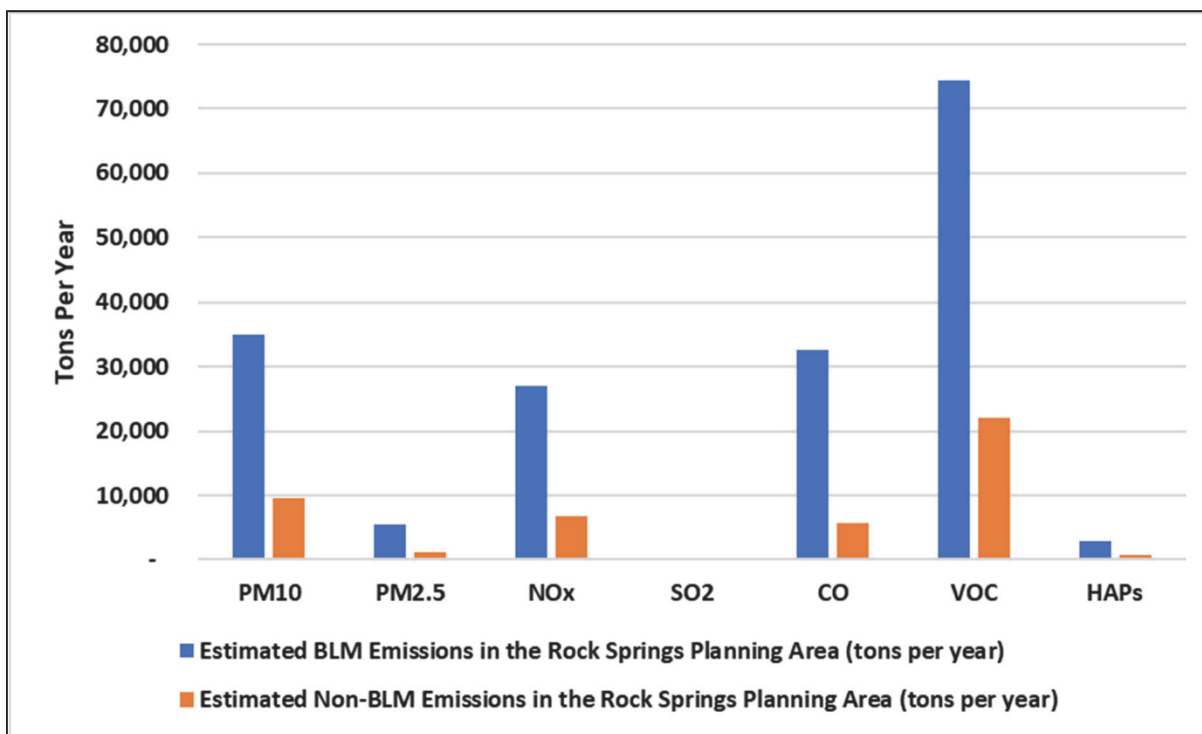


### Alternative C

Alternative C has the largest cumulative impact with emissions from BLM managed source emissions would be more than non-BLM managed source emissions, however would be less than the 2014 Wyoming statewide emissions in the planning area. Table T-6 shows criteria pollutant and HAP emissions from estimated BLM and non-BLM sources against the Wyoming statewide emissions inventory. PM<sub>10</sub> is the largest percentage of emissions contribution within the Rock Springs planning area with 23% of the total emissions contributed by activities on BLM land, whereas SO<sub>2</sub> is the lowest percentage at 0.2%. Figure T-3 shows the long-year emissions from BLM and non-BLM sources in the planning area under Alternative C.



**Figure T-3. Long Year Emissions from Bureau of Land Management and Non-Bureau of Land Management Sources in the Planning Area under Alternative C**

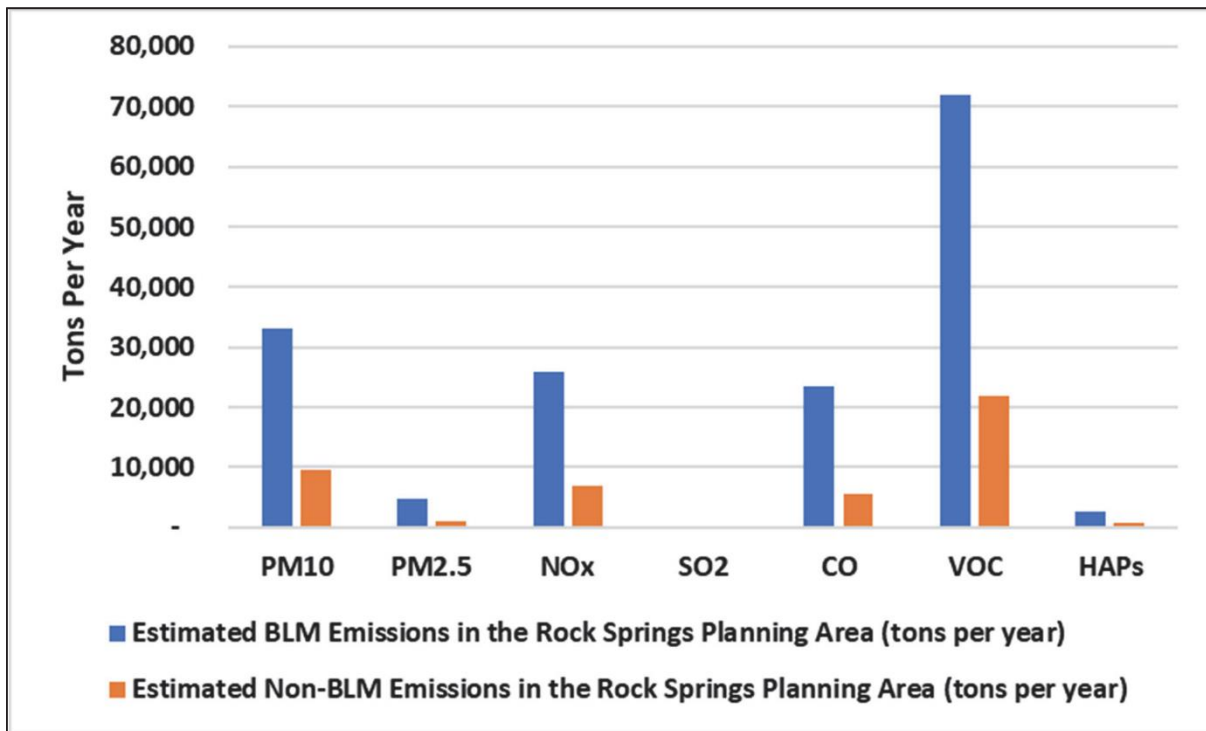


## Alternative D

Alternative D has similar cumulative impact as Alternative A, as emissions from BLM managed source emissions would be more than non-BLM managed source emissions, however would be less than the 2014 Wyoming statewide emissions in the planning area. Table T-6 shows criteria pollutant and HAP emissions from estimated BLM and non-BLM sources against the Wyoming statewide emissions inventory. PM<sub>10</sub> is the largest percentage of emissions contribution within the Rock Springs planning area with 22% of the total emissions contributed by activities on BLM land, whereas SO<sub>2</sub> is the lowest percentage at 0.1%. Figure T-4 shows the long-year emissions from BLM and non-BLM sources in the planning area under Alternative D.

Air resources were evaluated within the planning area to determine how air quality could be affected by future federal actions implemented under this RMP. Actions that initiate or increase emissions of air pollutants can result in negative effects on air resources, including increased concentrations of air pollutants, decreased visibility, increased atmospheric deposition on soils and vegetation, and acidification of sensitive water bodies. Actions that reduce or control emissions of air pollutants can be very effective at improving air quality and preventing degradation.

**Figure T-4. Long Year Emissions from Bureau of Land Management and Non-Bureau of Land Management Sources in the Planning Area under Alternative D**



## Greenhouse Gas Emissions

On January 2, 2011, the EPA began covering greenhouse gas emissions under the CAA from mobile and stationary sources of air pollution through prevention of significant deterioration (PSD) and Title V Operating Permit Programs, because of their contribution to global climate change. While leasing actions would not generate any direct or indirect greenhouse gas emissions, the BLM recognizes that the reasonably foreseeable consequence of leasing may be oil and gas development, and that such development could result in an increase in greenhouse gas emissions due to the post production or “downstream” uses of the petroleum products produced from these parcels. The BLM used readily available scientific information and reasonable assumptions about product end use to estimate potential downstream emissions attributable to this lease sale. It should be noted at the outset that the BLM does not exercise control over the specific end use of the oil and gas produced from any individual federal lease and has no authority to direct or regulate the end use of the produced products. As a result, the BLM can only provide an estimate of potential greenhouse gas emissions by assuming that all produced products would eventually be combusted. The uncertainty about end uses is in addition to the uncertainty with regard to the actual levels of development and production that may occur at any given well.

Table T-7, Estimated Greenhouse Gas Emissions from BLM Actions Due to Fossil Fuel Combustion, shows the comparison of greenhouse gas emissions from BLM actions for Alternative C (largest impact alternative) to U.S. reported greenhouse gas emissions from 2018, statewide reported greenhouse gas emissions from 2018, and Sweetwater County reported greenhouse gas emissions from 2018 (EPA 2020). The inventory was obtained from the EPA’s Facility Level Information on Greenhouse Gases Tool (FLIGHT) and was based on actual reported emissions for 2018. Greenhouse gas emissions estimated for the largest impact alternative (Alternative C) comprise a total of 64.56% of statewide greenhouse gas emissions. The largest impact of greenhouse gas emissions statewide is natural gas combustion, closely

followed by coal combustion. The total estimated greenhouse gas emissions for Alternative C (largest impact alternative) of 36.87 million metric tonnes are approximately equal to 1.2% of the total U.S. 2018 greenhouse gas emissions of 2,987 million metric tonnes of CO<sub>2</sub> equivalents (EPA 2020). In this analysis it was assumed that 100% of oil and associated gas produced included in this EIS would be attributed to fossil fuel combustion within the U.S. for residential heating and electricity.

**Table T-7. Estimated Greenhouse Gas Emissions from Bureau of Land Management Actions Due to Fossil Fuel Combustion**

BLM Alternative C - Long Year (year 20)		TOTAL U.S. GHG Emission Reported in 2018		TOTAL Wyoming GHG Emission Reported in 2018		TOTAL Sweetwater County GHG Emission Reported in 2018		Total Federal Lands GHG Emissions and Sequestration Reported in 2014	
Action	Estimated CO <sub>2</sub> eq (million metric tons)	CO <sub>2</sub> eq (million metric tons)	% BLM RSFO Contribution	CO <sub>2</sub> eq (million metric tons)	% BLM RSFO Contribution	CO <sub>2</sub> eq (million metric tons)	% BLM RSFO Contribution	CO <sub>2</sub> eq (million metric tons)	% BLM RSFO Contribution
Coal Combustion Total	15.85	2,987	0.53%	59.46	26.66%	16.88	88.09%	1,279	1.24%
Oil Combustion Total	3.38		0.11%		5.69 %		--*		8.99%
Natural Gas Combustion Total	17.47		0.58%		29.38%		--*		1.37%
Trona Transport Total	0.16		0.01%		0.27%		0.90%		0.01%
<b>TOTAL Emissions</b>	<b>36.87</b>		<b>1.23%</b>		<b>64.56%</b>		<b>88.99%</b>		<b>11.61%</b>

\* The majority of oil and gas is not combusted in the county; therefore, greenhouse gas downstream emissions are not completed for Sweetwater County.

Several activities contribute to the phenomena of climate change, including emissions of greenhouse gases (especially CO<sub>2</sub> and CH<sub>4</sub>) from fossil fuel development, large wildfires and activities using combustion engines; changes to the natural carbon cycle; and changes to radiative forces and reflectivity (albedo). It is important to note that greenhouse gases will have a sustained climatic impact over different temporal scales. For example, recent emissions of CO<sub>2</sub> can influence climate for 100 years.

At this time, the BLM is disclosing the likelihood and potential magnitude of downstream greenhouse gas emissions but is not able to disclose potential impacts to climate change from the estimated downstream greenhouse gas emissions related to mineral development and other activities. It may be difficult to discern whether global climate change is already affecting resources in the planning area (as opposed to on a global level). It is important to note that projected changes locally are likely to occur over several decades to a century. Therefore, many of the activities in the planning area associated with climate change may not be measurably discernible within the reasonably foreseeable future. Existing climate prediction models are

global or continental in scale; therefore, they are not appropriate to estimate potential impacts of climate change on the planning area. The current state of the science involves calculating potential quantities of greenhouse gases that may be added to the atmosphere from a particular activity. However, tools to analyze or predict how global or regional climate systems may be affected by a particular activity or activities within the planning area are not currently available. Assessing the impacts of greenhouse gas emissions on global climate change requires modeling on a global scale which is beyond the scope of this analysis. Potential impacts on climate change are influenced by greenhouse gas emission sources from around the globe and it is not possible to distinguish the impacts on global climate change from greenhouse gas emissions originating from the planning area.

The social cost of carbon (SCC) is an estimate of the monetized damages associated with a small increase in CO<sub>2</sub> emissions (typically one metric ton) in a particular year. This dollar figure also represents the value of damages avoided for a small emission reduction. SCC is meant to be a comprehensive estimate of climate change damages and includes changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change. Federal agencies use the SCC to incorporate the social benefits of reducing CO<sub>2</sub> emissions into the cost-benefit analyses of certain regulatory actions (Interagency Working Group on Social Cost of Carbon 2010; EPA 2015g).

Although the SCC can be a helpful tool to assess the benefits of CO<sub>2</sub> reductions, it does not include all damages given current modeling and data limitations. The models used to develop the SCC estimates do not include all of the important physical, ecological, and economic impacts of climate change because of a lack of precise data on the nature of potential damages and because the science used in the models lags behind the most recent research (EPA 2015g). The NEPA process does not require a cost-benefit analysis or a quantitative presentation of SCC cost estimates. Without the completion of a thorough cost-benefit analysis incorporating the social benefits of energy production, the inclusion of an SCC analysis would present only part of the necessary data. Therefore, the SCC protocol was not used in this analysis. Greenhouse gas combustion emissions are quantified and compared to national and global greenhouse gas emissions above.

## **Soil Resources**

The CIAA used to analyze cumulative impacts on soils includes the entire planning area. Surface-disturbing activities occurring within the planning area are not expected to affect soil resources outside the planning area. However, watershed impacts (sediment delivery to stream systems, sedimentation, changes in frequency, duration, and volume runoff) could extend beyond the planning area.

Cumulative impacts on soils would result from all surface-disturbing activities, removal of vegetation cover, soil compaction, and the associated accelerated erosion. Mineral development activities, including oil and gas, coal, and other minerals, and related construction of roads, pipelines, and well pads would be the primary cause of such disturbances; although activities such as utility corridor and wind energy development would also contribute cumulatively to localized impacts on soils. Vegetation treatments and large range improvements, including prescribed fire, have and would continue to affect soils resources locally, but the actions would increase vegetation cover and soil health over the long term. All forms of recreational activities, particularly OHV use, can increase potential for erosion, sedimentation, gully creation, biologic soil crust damage, and riparian and upland vegetation damage. Grazing of wild horses and livestock could affect soil resources in some areas where animals congregate, increasing soil loss, erosion, or soil compaction in these areas. However, the significance of impacts varies with the nature and degree of disturbance as well as site specific environmental conditions.

The implementation of the BLM's mitigation guidelines, restrictions on surface use, continued implementation of land health standards, and monitoring efforts would provide protection to soils on federal lands and lands with federal subsurface minerals, which would help reduce cumulative effects.

The greatest surface disturbing activities could occur under Alternative C, with Alternatives A and D having fewer, and Alternative B would have the most restrictions on surface disturbing activities. Cumulative impacts on soil resources would be highest under Alternative C, followed by Alternatives A and D, with Alternative B being the lowest.

## **Watershed and Water Quality**

The CIAA boundary for watershed resources and water quality includes watersheds that intersect the planning area (Map 3-1). While surface-disturbing activities within the planning area are not expected to affect watershed resources and water quality outside of the planning area, watershed impacts beyond the planning area are dependent on hydrograph alteration and the quality and quantity of water flowing from the planning area.

Degradation of the water resource can be a rapid process, whereas recovery is often much slower. The cumulative impacts on watersheds and water quality are dependent primarily on the health of the vegetative community, the amount of surface disturbance, the amount of pollutants, and the degree to which groundwater quality and quantity are degraded through human activity.

Cumulative impacts to water resources would occur as a result of surface disturbing activities from mineral and energy development, vehicle use, recreation, vegetation treatments, livestock grazing, and wildfire. These activities cause surface disturbances by removing vegetation cover, displacing and compacting soils, and altering soil structure and chemistry. The result is exposed surfaces that increase the potential for runoff and erosion, which delivers sediment and contaminants to nearby waterways. Sedimentation in waterways can cause changes in water chemistry as well as geomorphic adjustments that could have negative effects on stream function.

Accidental or direct inputs of nutrients, chemicals, or other pollutants may occur during development activities, recreation and vehicle use, wildfire, vegetation treatments, or from livestock or other grazing animals. Cumulative impacts from nutrients, chemicals, or other pollutants entering waterways could result in degraded or impaired water quality, including eutrophication of smaller streams or canals.

Best management practices (BMP), reclamation efforts, and monitoring of environmental conditions can minimize the impacts of development and the resulting disturbance to the hydrologic cycle, but they are not completely effective. Therefore, the greater the level of disturbance, through whatever source and means, to the vegetation, the land surface, and subsurface structure, the greater the disruption to the water resource.

The greatest surface disturbing activities could occur under Alternative C, with Alternatives A and D having fewer, and Alternative B would have the most restrictions on surface disturbing activities. Cumulative impacts to watersheds and water quality would be highest under Alternative C, followed by Alternatives A and D, with Alternative B being the lowest.

## **Vegetative Communities**

The CIAA used to analyze cumulative impacts on vegetation extends outside the planning area, following fourth-order watershed (eight-digit hydrologic unit code [HUC]) boundaries (Map 3-1). The CIAA is composed of fourth-order watersheds that completely or partially overlap the planning area. Fourth-order watersheds were used as the basic unit of analysis because the scope of cumulative influence would be at the watershed scale and is not expected to extend beyond this scale.

Cumulative effects on vegetation within the CIAA would result primarily from surface-disturbing activities that directly remove vegetation, such as mineral development and associated infrastructure, road and ROW development, rangeland improvements, and dispersed recreation. This would also indirectly affect vegetation by reducing the forage base, thereby increasing wildlife and livestock grazing on existing vegetation resources. The displacement of wildlife associated with surface-disturbing and other disruptive activities would also serve to increase grazing on non-disturbed vegetation resources. Surface disturbance would increase the proliferation of noxious and invasive weeds, which would increase the need for weed-controlling activities. Vegetation treatments would cause short-term impacts on vegetation by decreasing vegetation production and increasing establishment of early successional species. Long-term effects could include increased production and diversity of vegetation communities.

Oil and gas development would cause the greatest amount of surface disturbance through construction of well pads, roads, pipelines, and other facilities. Cumulative impacts would likely be greater where mineral development is more intense, and on state and private lands because of greater protections afforded to natural resources on public lands compared to state and private lands.

The degree of impact on vegetation communities would depend on the timing of activities and whether the amount of activity within the CIAA outpaces successful reclamation and revegetation efforts in disturbed areas. The implementation of the BLM's mitigation guidelines, BMPs, and restrictions on surface use would help to reduce overall effects. However, given the level of anticipated mineral development and that most of the native shrub communities (e.g., sagebrush) require in excess of 20 years to reestablish to pre-disturbance conditions, surface disturbance impacts are expected under all alternatives.

The greatest surface disturbing activities could occur under Alternative C, with Alternatives A and D having fewer, and Alternative B would have the most restrictions on surface disturbing activities. Cumulative impacts on vegetation resources would be highest under Alternative C, followed by Alternatives A and D, with Alternative B being the lowest.

## **Wildlife and Fisheries**

The CIAAs used to analyze potential impacts on wildlife and fisheries vary by species. The CIAAs for pronghorn, mule deer, elk, and moose comprise the HMAs (for each species) that intersect the planning area (Map 3-3). The CIAA for all other wildlife comprises the planning area. The CIAA for fisheries covers the same area as the CIAA for water quality and watershed resources. It extends outside the planning area, following fourth-order watershed (eight-digit HUC) boundaries (Map 3-1).

Cumulative effects on wildlife and fisheries within the CIAAs would result primarily from surface-disturbing and other disruptive activities such as mineral and energy development and associated infrastructure, geophysical exploration, urban expansion and subdivision of private lands, ROWs, rangeland improvements, fences of all kinds, vegetation treatments, and dispersed recreation. These activities could result in short-term and long-term habitat fragmentation and animal displacement. Habitats could become unavailable to wildlife because of human disturbance factors (e.g., traffic, machinery, noise, livestock grazing activities) during sensitive time periods such as winter, birthing, nesting, and early rearing of young. Loss of vegetation from development activities would degrade habitat and increase forage competition among grazing animals. Livestock grazing practices could further increase cumulative impacts through direct competition for forage, water, and space, and by limiting the ability to manage vegetation for fish and wildlife needs. These impacts would also reduce the capability to maintain current population objectives.

Oil and gas development would cause the greatest amount of surface disturbance through construction of well pads, roads, pipelines, and other facilities. Reclamation and mitigation efforts would reduce impacts

on wildlife habitat and fisheries; however, construction and maintenance of roads and well pads and the presence of humans would result in long-term or permanent impacts. Cumulative impacts would likely be greater where mineral development is more intense, in areas where development overlaps with crucial and winter wildlife ranges, and on state and private lands because of the lack of protections afforded to natural resources in these areas. As development expands throughout southwestern Wyoming, the ability of big game and other wildlife species to disperse into habitats outside of the planning area could become limited. This may create isolated populations in areas where habitats remain intact. The degree of impact would depend on the timing of development activities and whether the amount of activity within each CIAA outpaces the successful reclamation and revegetation efforts in disturbed areas. Because of this pace of development (whether federal mineral, commercial, or private residence), more pressure would be put on habitats outside of the development (likely private lands) as wildlife is displaced from the disturbances.

Crucial winter range and birthing habitat are important areas to the viability of big game. Persistent disturbance in sensitive habitats would shift the areas of use and weaken the tendency of the animals to return to the disturbed area. If animals return to disturbed habitat, populations could be lower and use of the habitat could be unpredictable. Mineral development activities would likely cause displacement of animals and selection of alternative habitats and would likely inhibit big game movement between winter ranges and birthing areas. The displacement of big game, and specifically mule deer, from high-use to low-use areas has the potential to influence survival and reproduction (Sawyer et al. 2006). Should migration be disrupted and key habitats continue to be degraded over a short period of time, it is likely that long-term displacement of big game from these habitats would occur.

The health of fisheries within the CIAA is directly related to the overall health and functional capabilities of riparian resources, which are a reflection of watershed health. It is assumed that any substantial unmitigated disturbances to the soils or changes in vegetative cover would have an adverse effect on watershed health and water quality and would therefore have an adverse effect on associated fisheries. The degree of impact attributed to any one disturbance or series of disturbances is influenced by location within the watershed, time and degree of disturbance, existing vegetation, and precipitation. Surface disturbances would result in accelerated erosion and runoff, increasing stream flow and sediment and nutrient loads to local channels. Sedimentation of a stream channel could impact fisheries by reducing habitat complexity, which results in a lower diversity of prey organisms. Increased turbidity would result from increased sediment input, which decreases light penetration and inhibits visual predation by fish. Surface disturbance near streams that results in substantial removal of riparian vegetation could increase current velocity, which puts additional strain on fish and reduces nutrient cycling. In addition to increased sediment input, stream bank disturbance could impact fisheries by creating bank instability, which would alter flow regimes and destroy pool-riffle formations necessary for fish survival. Increased nutrient loading of streams can impact fisheries by increasing primary production above natural levels, which degrades habitat and decreases oxygen levels. Surface disturbance and timing restrictions and stipulations afforded all streams and riparian areas within the planning area would help to reduce impacts. Conventional oil and gas and CBNG development activities would be the primary cause of surface disturbance and related impacts on fisheries on public lands in the RSFO.

Because stream systems within the planning area are not entirely under BLM management and cross onto state and private ownerships, the connectivity of these streams is sometimes incomplete. Thus, the metapopulations for fish species are also disconnected. Often this occurs because of irrigation diversions or other such barriers that do not allow for migration between smaller headwater streams via the larger streams and rivers. Population objectives sometimes reflect these discontinuities, and re-establishment of connectivity is usually a major goal. Without this connectivity and with a continuation of additional fragmentation within the entire CIAA, populations of many fish species would continue to be threatened.

Impacts on wildlife would likely occur under all alternatives because of the loss of vital, high-value habitats and corridors between these habitats. The success of disturbed land reclamation, both short and long term, would determine the duration of impacts. The greatest surface disturbing activities could occur under Alternative C, with Alternatives A and D having fewer, and Alternative B would have the most restrictions on surface disturbing activities. Cumulative impacts on wildlife and fisheries habitat would be highest under Alternative C, followed by Alternatives A and D, with Alternative B being the lowest.

## Special Status Species

The CIAA used to analyze potential impacts on Special Status Species vary by species and the habitat they inhabit or use for migration (for wildlife) both inside and adjacent to the planning area. The CIAA for special status fisheries covers the same area as the CIAA for water quality and watershed resources. It extends outside the planning area, following fourth-order watershed (eight-digit HUC) boundaries (Map 3-1).

Cumulative effects on Special Status Species plants and animals within the CIAA would result primarily from surface-disturbing and other disruptive activities such as mineral development and associated infrastructure, wind energy development, fences of all kinds, ROW and road development, prescribed and wildfire, introduction and spread of non-native, invasive plant species; urban expansion and subdivision of private lands, and dispersed recreation. These activities could result in short-term and long-term habitat loss, fragmentation, and animal displacement. Habitats could become unavailable to wildlife because of human disturbance factors (e.g., traffic, noise, energy development) during sensitive time periods such as winter, birthing, nesting, and early rearing of young. Loss of vegetation from development activities would degrade habitat and increase competition for food resources among special status and other wildlife species. Potential habitat for special status plants could be lost during development or other surface disturbing activities.

Depending on the extent and timing of activity (e.g., hiking, camping, or recreation), over time, casual use could cause slight to significant incremental changes to habitats that may be occupied by Special Status Species or provide necessary habitat components. Impacts could include trampling of special status plant species or damage to Special Status Species habitats, introducing noise or dust that can disturb species during sensitive periods, introducing invasive weeds or disease, degrading Special Status Species habitat, and causing direct or stress-related mortality. Stationary species such as plants would be particularly susceptible to cumulative effects from mineral development, recreation, wildfire, and livestock grazing. With the eventual increases of casual use resulting from increased populations or popularity of the area for recreation activity, incremental impacts could become significant for some species.

Permitted activities result in ground disturbance that could accumulate to affect large expanses of habitat. Surface disturbances could remove or degrade native vegetation, fragment habitats, introduce invasive weeds, displace species, cause abandonment of nesting and breeding areas, reduce availability of key habitat components, and reduce reproduction and survivability. However, all permitted activities, including reasonably foreseeable well development on federal minerals, proposed pipelines traversing the planning area, and mineral claims, would require BLM consultation to ensure projects would not adversely affect Special Status Species at a cumulative level. Additionally, BLM policy requires other Special Status Species of non-federal status (such as BLM sensitive and state-listed species) to receive the same protection and consideration as federally protected species.

Oil and gas development would cause the greatest amount of surface disturbance through construction of well pads, roads, pipelines, and other facilities. Reclamation and mitigation efforts would reduce impacts on special status wildlife; however, construction and maintenance of roads and well pads and the presence



of humans would result in long-term or permanent impacts. Special Status Species, under the Endangered Species Act (ESA) and Wyoming BLM sensitive species guidance, would be protected on federal lands by site-specific mitigation, including exclusion or avoidance of all surface-disturbing activities; however, protection of non-federally listed species on private and state lands may not occur, resulting in potentially significant impacts on these species. The degree of impact would depend on the timing of development activities and whether the amount of activity outpaces the successful reclamation and revegetation efforts in disturbed areas. Because of this pace of development (whether federal mineral, commercial, or private residence), more pressure would be put on habitats outside of the development (likely private lands) as wildlife is displaced from the disturbances.

Surface disturbance could increase the proliferation of noxious and invasive weeds, which could increase the need for weed-controlling activities. Vegetation treatments could cause short-term impacts on vegetation by decreasing vegetation production and increasing establishment of early successional species. Long-term effects could include increased production and diversity of vegetation communities. Untreated weeds on non-BLM lands that spread to adjacent BLM-administered lands would result in degradation of native habitat. Weed treatments on non-BLM lands which are intermingled with BLM-administered lands are the responsibility of the private landowner or lessee. Coordination with non-BLM landowners in the development and application of weed treatments would assure that weeds are identified and treated on all ownerships to maintain productivity of native vegetation, which comprises important wildlife habitats. Special status plant species, under the ESA and Wyoming BLM sensitive species guidance, would be protected on federal lands by site-specific mitigation, including exclusion or avoidance of all surface-disturbing activities; however, protection of these species on private and state lands may not occur, resulting in potentially significant impacts on these species.

The degree of impact on vegetation communities (habitat for special status wildlife) would depend on the timing of activities and whether the amount of activity within the CIAA outpaces successful reclamation and revegetation efforts in disturbed areas. The implementation of BLM mitigation guidelines, BMPs, and restrictions on surface use would help to reduce overall effects. However, given the level of anticipated mineral development and that most of the native shrub communities (e.g., sagebrush) require in excess of 20 years to reestablish to pre-disturbance conditions.

The greatest surface disturbing activities could occur under Alternative C, with Alternatives A and D having fewer, and Alternative B would have the most restrictions on surface disturbing activities. Cumulative impacts on Special Status Species habitat would be highest under Alternative C, followed by Alternatives A and D, with Alternative B being the lowest.

## Wild Horses

The CIAA used to analyze cumulative impacts on wild horses includes the active HMAs within the planning area. Cumulative impacts would occur from a combination of activities and uses occurring within the HMAs. Past, present, and reasonably foreseeable future actions and conditions within the CIAA that have affected and will likely to continue to affect wild horses are wildfires, surface-disturbing activities, the presence and abundance of grazing wildlife and livestock, increased recreational demands, and protections for sensitive resources.

Potential cumulative impacts on wild horses within the HMAs would result from a combination of activities and land uses occurring within the area. Such impacts would result primarily from surface-disturbing activities, human disturbance, and the presence of livestock that compete with wild horses for forage resources. These activities result in wild horse displacement and direct removal and indirect degradation of forage. Wild horses would directly benefit from actions to increase forage opportunities, to improve range conditions, to maintain or improve water sources, and to eliminate barriers to movement. Restrictions and prohibitions on surface disturbing activities, as well as reclamation efforts and vegetation treatments would reduce impacts on wild horses. A reduction in development and recreation activities would decrease soil disturbances and vegetation removal, increase available forage, and decrease the displacement of wild horses. Wild horses would indirectly benefit from restrictions on motorized travel or other potentials for disturbance from people and vehicles.

The greatest surface disturbing activities could occur under Alternative C, with Alternatives A and D having fewer, and Alternative B would have the most restrictions on surface disturbing activities. Cumulative impacts to wild horses would be highest under Alternative C, followed by Alternatives A and D, with Alternative B being the lowest.

## Wildland Fire Ecology and Management

The CIAA used to analyze cumulative impacts on fire management includes the entire planning area. Because of noncontinuous fuels, low historic fire incidence, and significant fuel breaks (e.g., state and county roads), management activities occurring within the planning area would not be expected to affect fire management outside of the planning area for the majority of the planning area.

Cumulative impacts on wildland fire management would occur as a result of the increased or decreased surface disturbances from development, grazing, recreation activities, and fire management occurring within the planning area. As general use, recreation, mineral development, and grazing increase as a whole throughout the planning area, potential for impacts to fire management, would increase as greater human traffic and activities would increase potential ignition sources.

With increased development and attendant infrastructure (e.g., power lines, compressors, pipelines, and fuel tanks) comes a corresponding increase in the potential for fire suppression to occur within Wildland Urban Interface (WUI) areas. Suppression activities within WUI areas can be more dangerous, time-consuming, and expensive than suppression in undeveloped areas. Particularly critical would be the extra caution required for firefighter safety within an active gas field. This increased development would also impact the fuels management activities within the oil and gas fields. Increasing the amount of oil and gas development would require more WUI/industrial interface fuels treatment projects and would tax the BLM's ability to plan, fund, and implement these projects. The greatest surface disturbing activities could occur under Alternative C, with Alternatives A and D having fewer, and Alternative B would have the most restrictions on surface disturbing activities. Cumulative impacts to wildland fire management would be highest under Alternative C, followed by Alternatives A and D, with Alternative B being the lowest.

## Cultural Resources

The CIAA for cultural resources includes the entire planning area and neighboring lands with a high potential for connected resources. Potential cumulative impacts on cultural resources would result from surface-disturbing activities that cause erosion or vibration from traffic and/or machinery, soil compaction, and landscape alteration. Oil and gas development would cause the greatest amount of cumulative effects on cultural resources from construction of well pads, roads, pipelines, and diverse ancillary facilities. These development actions could result in damage to or loss of cultural resources. Direct impacts on cultural resources can occur from unanticipated subsurface discoveries (cultural resources discovered during project construction activities). Post review discoveries generally result in the irretrievable loss of some or occasionally all of the cultural resource involved. Even when salvage excavations result in the retrieval of some or a substantial amount of data, the nature of archaeological discovery during surface-disturbing activities results in the partial loss of information (e.g., spatial data, associated materials that wind up in the spoil piles). Surface-disturbing activities (e.g., mineral development, livestock grazing improvements, dispersed recreation) on private, state, and other federal lands within the CIAA would substantially increase the level of cumulative impact on cultural resources.

Surface-disturbing activities that occur in close proximity to sensitive Native American sites and some historic sites would potentially introduce visual atmospheric or audible indirect intrusions to those sites where the setting contributes to their National Register of Historic Places (NRHP) eligibility. This would result in a cumulative loss of the integrity of the setting of sensitive Native American sites and the setting of historic trails. Projects implemented on land owned by the State of Wyoming and on private surface where the BLM's cultural resource process does not apply could result in substantial cumulative effects.

Potential impacts on cultural resources would be in part mitigated by Cultural Resource Management Plan actions; implementation of federal regulatory laws, actions, and guidelines designed to protect cultural resources; and through consultation processes with the State Historic Preservation Office and Native American tribal representatives. However, it is anticipated that such measures would not prevent many impacts from occurring. Severe impacts would be likely to occur in situations in which undocumented NRHP-eligible archaeological sites are impacted but not recognized.

Activities permitted through the BLM (such as leasing of federal minerals, and mining on federal minerals) would likely disturb cultural resources. Compliance with Section 106 of the National Historic Preservation Act would be required either through the State Protocol or the Section 106 regulations at 36 CFR 800 for these activities, which would require cultural surveys and avoidance or mitigation of identified sites. This could incrementally result in the identification of more cultural resources, and an increase in information concerning cultural resources within the planning area. However, cultural resources are best interpreted when studied on a landscape level, identifying regional similarities and variations. Continuing to identify and study cultural resources through project mitigation would preserve the cultural resources, but if not done with proper consideration and foresight could result in the loss of regional cultural context. Professional research, documentation, and preservation where necessary would mitigate incremental impacts by preserving the regional context and values associated with the individual and collective sites.

The greatest surface disturbing activities could occur under Alternative C, with Alternatives A and D having fewer, and Alternative B would have the most restrictions on surface disturbing activities. Cumulative impacts to cultural resources would be highest under Alternative C, followed by Alternatives A and D, with Alternative B being the lowest.

## Paleontological Resources

The CIAA used to analyze cumulative impacts on paleontological resources includes the entire planning area. Management activities occurring within the planning area are not expected to affect paleontological resources outside of the planning area.

Potential cumulative impacts on paleontological resources would result primarily from surface-disturbing activities that cause erosion or vibration from traffic and/or machinery, soil compaction, and landscape alteration. These types of activity could result in exposure, damage, and/or destruction of paleontological resources. The policies associated with the paleontological resource management program, which require identification and mitigation of paleontological resources prior to surface-disturbing activities, would help to reduce potential impacts. Implementation of these requirements would also increase the potential for identification, recordation, and collection of paleontological resources. However, even with identification and mitigation requirements, the potential exists for damage or destruction of previously unknown paleontological resources discovered during construction. In addition, OHV use, dispersed recreation, and other surface-disturbing activities not subject to a permitting process could result in exposure, damage, or destruction of paleontological resources.

Surface-disturbing and recreational activities that occur on private and state lands would result in substantial impacts on paleontological resources because of the lack of legal protections afforded to these resources on these lands. Approximately 1,450,000 acres of state and private land occurs within the CIAA, on which activities and development are expected to cause substantial damage to or destruction of paleontological resources or result in the improper collection of scientifically important paleontological resources. The greatest surface disturbing activities could occur under Alternative C, with Alternatives A and D having fewer, and Alternative B would have the most restrictions on surface disturbing activities. Cumulative impacts to paleontological resources would be highest under Alternative C, followed by Alternatives A and D, with Alternative B being the lowest.

## Lands with Wilderness Characteristics

The CIAA used to analyze cumulative impacts on lands with wilderness characteristics includes the entire planning area. Cumulative impacts on lands with wilderness characteristics would primarily occur from human presence and surface disturbing activities associated with development, construction, and recreation activities. This would include activities related to fluid mineral well development, mining, OHV use, and construction of power lines, wind turbines, generators, substations, and other above-ground facilities. Such surface-disturbing and disruptive activities within and in the vicinity of the nine areas determined to contain wilderness characteristics would degrade those characteristics. These activities involve land clearing, grading, soil disturbance, the removal of vegetative cover, and the construction of roads, well pads and other support facilities. Such activities occurring on lands with wilderness characteristics would impact both the naturalness and opportunities for solitude and primitive recreation. Naturalness would be degraded or eliminated primarily from increases in human activity, modifications to the landscape, and visual intrusions caused by the construction of roads, well pads, development sites, and other facilities. Opportunities for solitude and primitive recreation would be reduced or eliminated by increases in noise and the presence of people, vehicles, and equipment associated with OHV use and exploration and development of mineral resources. Once mineral development activities are completed, opportunities for solitude and primitive recreation could return. However, productive wells would remain in place and would be substantially noticeable until the wells are decommissioned and disturbance is reclaimed, thereby eliminating naturalness for the life of the well. Restoration activities would reduce the loss of naturalness, especially on exploration wells that would be rehabilitated and revegetated over the short term.

As development of public, private, and state-owned lands continues, the importance of protecting lands with wilderness characteristics would increase and the values of these areas would increase as development

proceeds on surrounding areas. As solitude and primitive recreation experiences become rarer, additional people would be drawn to lands with wilderness characteristics for their open space and undeveloped characteristics. The implementation of the BLM's mitigation guidelines, reclamation requirements, restrictions on surface use, rangeland guidelines, vegetation treatments, and monitoring efforts would provide protection to resource values, which would help reduce overall effects on lands with wilderness characteristics.

Cumulative impacts on lands with wilderness characteristics would be greatest under Alternative C because development activities are anticipated to be greatest under this alternative. Impacts would be the least intensive under Alternative B because of increased protections to sensitive resources and from prohibiting or limiting the amount of surface disturbance that would occur throughout the planning area.

## **Visual Resources**

The CIAA used to analyze cumulative impacts on visual resources includes the entire planning area. Potential impacts on VRM would result primarily from surface disturbance activities that cause visual intrusions and degrade the visual quality of the CIAA. Activities related to oil and gas development, wind energy projects, pipeline projects, and communication towers would have the potential to degrade visual resources and result in inconsistencies with VRM Class objectives. Cumulative impacts would likely be greater in areas where mineral development is more intense, and near state and privately owned lands because of the BLM's lack of authority on these lands. Impacts would be lowest in areas managed for VRM Class I objectives such as wilderness study areas (WSA) and other special management areas.

Cumulative impacts on visual resources would be greatest under Alternative C because development activities are anticipated to be greatest under this alternative. Impacts would be the least intensive under Alternative B because of increased protections to sensitive resources and from prohibiting or limiting the amount of surface disturbance that would occur throughout the planning area.

## **Minerals and Renewable Energy**

The CIAA used to analyze cumulative impacts on minerals management and renewable energy development includes the entire planning area. Management activities occurring within the planning area are not expected to affect mineral resource and renewable energy development management outside of the planning area. Past, present and reasonably foreseeable future actions and conditions within the CIAA that have affected and will likely to continue to affect minerals and renewable energy are market forces, availability of resources for development, regulatory and prescriptive constraints, and reservoir/reserve depletion.

Cumulative impacts on mineral development would occur from restrictions that prohibit or restrict surface disturbance that ultimately decrease the number of oil and gas wells drilled during the planning period, as well as the acres of land open to solid mineral leasing, mineral material disposal, and the location of mining claims. Prohibiting surface disturbance would not allow for the development of solid, locatable, and saleable minerals and would prohibit the construction of some well pads, access roads, pipelines, and ancillary facilities. Offsite methods such as directional drilling would be required to access oil and gas resources. In some cases, an operator could place a well pad, access road, or production facility in a less-sensitive area and drill to the well directionally to recover reserves underlying the area prohibited from surface disturbing activities. The equipment and personnel required for directional drilling could increase the complexity of operations and slow the drilling process. Directional drilling increases the risk of drilling problems such as stuck casing and diminished well production. Prohibiting surface disturbance and applying extra lease stipulations and terms could also cause an operator to move to nearby private or state land with no such restrictions and drill wells that could lead to drainage of federal reserves and loss of federal revenue. However, the indirect and cumulative effects of consolidating infrastructure over the life

of multiple oil and gas reserves could reduce the need for ancillary infrastructure over the larger region as infrastructure becomes more centralized, and less infrastructure would be necessary to deliver products downstream.

Restricting surface disturbance could lead to the relocation of well pads, access roads, pipelines, and ancillary facilities to areas with fewer restrictions. Relocation of these proposed facilities could cause temporary delays in developing oil and gas resources and other minerals and could limit mineral development activities in these areas. Oil and gas and other mineral development are expected to continue under all alternatives. Implementing Alternative C would result in the development of the greatest number of wells during the planning period. Alternative B would result in the least number wells because of surface disturbance restrictions.

Solid, saleable, and locatable mineral operations would continue under all alternatives. However, new development would be restricted from an increase in lands identified as unsuitable for coal leasing and closed to solid and saleable, mineral development and proposed for withdrawal for locatable mineral entry. The degree of impact would be lowest under Alternative C because of fewer land use restrictions for the protection of sensitive resources. Conversely, the implementation of increased restrictions to protect sensitive resources under Alternative B would result in the greatest level of impact on mineral development.

Similarly, prohibiting and restricting surface disturbing activities would limit the development of renewable energy, and could cause project proponents to relocate and/or move to nearby private or state land with no such restrictions. This could cause temporary delays in developing renewable energy. If suitable adjacent sites are not available, renewable energy development could be prohibited. Renewable energy development is expected to continue under all alternatives. The degree of impact would be lowest under Alternative C because of fewer land use restrictions for the protection of sensitive resources. Conversely, the implementation of increased restrictions to protect sensitive resources under Alternative B would result in the greatest level of impact on renewable energy development.

## **Livestock Grazing Management**

The CIAA used to analyze cumulative impacts on livestock grazing includes all grazing allotments within the planning area (Map 3-11). Livestock are managed within the boundaries of these allotments and therefore could be affected by activities occurring in these areas.

Potential cumulative impacts on livestock grazing operations would result from a combination of activities and land uses occurring within the CIAA. Such impacts would result primarily from surface-disturbing activities, human disturbance, and the presence of wildlife that compete with livestock for rangeland resources. These activities result in livestock displacement, direct removal and indirect degradation of forage, and direct and indirect costs to the grazing permittee. Reclamation efforts and vegetation treatments would reduce impacts on livestock grazing; however, construction of roads and well pads and the constant presence of humans and wildlife would result in long-term impacts.

An increase in human population would create additional demands for recreational use of the public lands used for grazing and could result in livestock displacement, increases in noxious weed infestation, and costs to operators and public land management areas. Oil and gas development activities and related construction of roads, pipelines, and well pads would lead to a cumulative increase in soil disturbance, vegetation removal, noxious and invasive weed proliferation, and livestock displacement. Impacts would be greater in areas with high-density mineral development projects. These impacts could result in substantial rangeland degradation and thereby jeopardize compliance with the Wyoming Standards for Healthy Rangelands (USDI, BLM 1997) on some allotments. The implementation of the BLM's mitigation guidelines, reclamation requirements, restrictions on surface use, rangeland guidelines, vegetation treatments, and

monitoring efforts would provide protection to forage resources on federal lands, which would help reduce overall effects on livestock grazing resources and operations.

The promotion of natural fire in the ecosystem, along with vegetation treatments to improve habitats, will place more of the vegetation communities in the lower seral stage. Generally, this improves and increases the forage resource, and from the standpoint of the CIAA, could offset forage losses that may occur from large-scale industrial development in some areas.

The greatest surface disturbing activities could occur under Alternative C, with Alternatives A and D having fewer, and Alternative B would have the most restrictions on surface disturbing activities. Cumulative impacts to livestock grazing management would be highest under Alternative C, followed by Alternatives A and D, with Alternative B being the lowest.

## Recreation

The CIAA used to analyze cumulative impacts on recreation resources includes the planning area, and big game herd units that intersect the planning area. Wildlife populations are managed within these boundaries and therefore could be impacted by activities occurring in these areas. Because hunting and wildlife viewing are recreation activities within the planning area, any activities that affect game populations would in turn impact recreation activities and reduce recreation benefits.

Cumulative impacts on recreation would potentially occur from a mixture of land uses that results in conflicts for unconfined, dispersed recreational opportunities. Impacts are a result of both increased recreational activity occurring within and outside of the planning area and user conflicts generated from planned actions. Surface-disturbing activities (primarily oil and gas development) would alter recreational settings and degrade some recreational experiences through increased visual intrusions, noise levels, traffic volumes, and concerns for public health and safety. In areas where development occurs, hunting opportunities would be diminished because of the displacement or loss of game animals. This would further increase cumulative effects to recreation by degrading a major recreation activity. Seasonal restrictions designed to protect sensitive resources could reduce recreational opportunities for some users by limiting access to certain areas; however, restrictions could also enhance the experience of other users who desire solitude, wildlife viewing, and primitive recreation opportunities. Cumulative impacts would likely be greater in all portions of the CIAA where mineral development is more intense, and near state and private lands because of the lack of protections afforded to natural resources in these areas. The greatest surface disturbing activities could occur under Alternative C, with Alternatives A and D having fewer, and Alternative B would have the most restrictions on surface disturbing activities. Cumulative impacts to recreation would be highest under Alternative C, followed by Alternatives A and D, with Alternative B being the lowest.

## Forestry and Woodlands

The CIAA used to analyze cumulative impacts on forest management extends outside the planning area, following fourth-order watershed (eight-digit HUC) boundaries (Map 3-1). The CIAA is composed of fourth-order watersheds that completely or partially overlap the planning area. The fourth-order watersheds were used as the basic unit of analysis because the scope of cumulative influence would be at the watershed scale and is not expected to extend beyond this scale.

Some of the cumulative impacts on forest management would result from surface-disturbing actions that remove forest cover. Because mineral development activities would take place mainly outside of forested areas, cumulative impacts would be minimal. However, woodland forest communities occur in areas that have a higher potential for oil and gas development, thus creating the potential for impacts on these areas. Impacts would include direct removal of forest cover to develop well sites, roads, and surface infrastructure. These areas would be taken out of timber harvest production for the life of the well or mining operations.

Mineral resource development activity can also benefit forest management by providing opportunities for increased accessibility to potential harvest or management areas.

Management actions designed to protect sensitive resources would, in some cases, result in the exclusion of forestland from harvesting of forest products or other mechanical forest health treatments, limiting options available for forest stand restoration.

The greatest surface disturbing activities could occur under Alternative C, with Alternatives A and D having fewer, and Alternative B would have the most restrictions on surface disturbing activities. Cumulative impacts to forestry and woodland resources would be highest under Alternative C, followed by Alternatives A and D, with Alternative B being the lowest.

## **Lands and Realty**

The CIAA used to analyze cumulative impacts on the uses administered by the lands and realty program includes the entire planning area.

Impacts on lands and realty management would result from actions that affect the location and design of proposed ROWs. These actions are primarily the result of implementing surface use restrictions (e.g., VRM designations, land use closures, NSO stipulations) and management prescriptions designed to protect natural resources. These actions would limit or restrict ROW project design and where ROWs would be permitted. The greatest impacts would occur in areas managed to meet VRM Class II objectives, as avoidance or exclusion areas for ROWs, and in areas managed with NSO stipulations.

The actions and activities considered in this analysis, including land use restrictions for the preservation of sensitive resources, would not prevent the BLM from accommodating major utility and transportation corridors. The degree of impact would be lowest under Alternative C because of fewer land use restrictions for the protection of sensitive resources. Conversely, the implementation of increased restrictions to protect sensitive resources under Alternative B would result in the greatest level of impact on lands and realty.



## Special Designations

The CIAA used to analyze cumulative impacts on special designations includes the entire planning area. Because management associated with special designations are intended to protect the resource values and uses for which they have been identified, it is not anticipated that any additional activities outside of the planning area would have a cumulative impact on special designations. Cumulative impacts on special designations would primarily occur from human presence and surface disturbing activities associated with development, construction and recreation activities. This would include activities related to fluid mineral well development, mining, OHV use, and construction of power lines, wind turbines, generators, substations, and other above-ground facilities.

Many of the resource values for which special designation areas were originally designated would be directly or indirectly impacted by surface disturbing activities. Examples of resource values that would be impacted by surface disturbance include cultural and paleontology, wildlife, vegetation, soils and watersheds, visual resources, and primitive and semi-primitive recreational opportunities. Increased levels of development and other surface disturbing activities could result in the loss or degradation of undiscovered cultural and paleontological resources. Modifications to the landscape caused by surface disturbance could impact vegetation communities and increase soil erosion and the overall integrity of the landscape which could also have a direct impact on wildlife habitat. Additionally, increased levels of surface disturbance and the associated increase use of heavy equipment, presence of humans, and increase noise levels could result in increased stress levels to wildlife and on their movement and migration patterns and natural habitat. Impacts to the integrity of the landscape caused from surface disturbance would result in the degradation of visual qualities and opportunities for primitive and semi-primitive recreational experiences.

As development of public, private, and state-owned lands continues, the importance of protecting special designations would increase and the values of these areas would increase as development proceeds on surrounding areas. As solitude and primitive recreation experiences become rarer, additional people would be drawn to the WSAs and other special designations for their open space and undeveloped characteristics. The implementation of the BLM's mitigation guidelines, reclamation requirements, restrictions on surface use, rangeland guidelines, vegetation treatments, and monitoring efforts would provide protection to resource values, which would help reduce overall effects on special designations.

Cumulative impacts on special designations would be greatest under Alternative C because development activities are anticipated to be greatest under this alternative. Impacts would be the least intensive under Alternative B because of increased protections to sensitive resources and from prohibiting or limiting the amount of surface disturbance that would occur throughout the planning area.

## Socioeconomics

The CIAA used to analyze cumulative impacts on socioeconomics extends beyond the planning area, to include the entire socioeconomic study area consisting of Fremont, Lincoln, Sublette, Sweetwater, and Uinta counties. Section 4.23 describes the socioeconomic impacts of BLM actions on the socioeconomic study area. These impacts take place in the context of social and economic impacts from resource uses on other lands in the socioeconomic study area, social and economic impacts driven by other activities in the socioeconomic study area (e.g., public infrastructure development), and broader social and economic trends (e.g., in- and out-migration, changes in social values, trends in energy prices, etc.). Thus, the socioeconomic impacts from BLM decisions in this planning action are just a part of the many contributing factors to the social and economic changes taking place in the socioeconomic study area.

Oil and gas activity development activity is expected to occur on both public and private lands throughout southwestern Wyoming during the planning period. BLM-administered land is just one contributor, albeit

a large one, to the overall level of development. The intensity of development in the oil and gas sector reflects both public policy and market forces. Even though leasing and management of oil and gas resources are affected by BLM decisions, the timing and pace of development reflects market forces established by various factors beyond the management decisions of the BLM. These include national and international energy demand and prices, production factors within the CIAA, and business strategies of operators. These factors affect development on both BLM and non-BLM resources. As a result, it is difficult to estimate the pace of development, which means the actual cumulative impacts might vary if the rate of development changes during the study period.

During the planning period, it is likely that communities within the socioeconomic study area will be affected by the oil and gas development “boom and bust” cycle and the intensity or magnitude of this cycle would be a function of pace. It is likely that individuals from outside the area would fill many of the jobs created during the boom portion of the cycle. Temporary and permanent population increases in certain parts of the study area would be directly attributable to oil and gas development across BLM and non-BLM mineral resources. Moreover, it is anticipated that this phenomenon would likely cause hardships for areas that must improve or expand infrastructure and public services to accommodate increases in population. However, these hardships would be offset to some extent by the tax revenues generated by oil and gas activity. The larger impacted communities may be in a slightly better position to absorb increases in population relative to the smaller ones. This is probably also true during any downturns in oil and gas economic activities. A larger community typically has a more diverse economic base that is less dependent on a single industry. Population changes driven by total levels of oil and gas development may also cause changes in local social cohesion, customs, and culture. This would also vary by community, because some areas have a long-standing history of growth driven by minerals development, and some do not.

Levels of coal and trona production in the RSFO over the planning period will be determined largely by market conditions, including commodity prices and costs of production. It is possible that coal production and attendant economic activity could decline over time due to price competition from other energy sources or broader (non-BLM) regulatory factors. None of the alternatives would impact coal and trona production in ways that significantly exacerbate or counter the larger forces acting on these industries.

Wind energy development in the socioeconomic study area is driven by favorable wind resources and demand for renewable energy. This market demand comes from population centers well beyond Wyoming’s borders, and is likely to continue or increase during the planning period. Large-scale wind energy projects on non-BLM administered land in the socioeconomic study area may be proposed and built during the planning period. A combination of large projects on both BLM and non-BLM land would create significant economic activity in the socioeconomic study area, but could also exacerbate pressures on the local economy, public services, and social systems from influxes of construction workers. This would be particularly true if this activity were to coincide with a “boom” period in oil and gas development, which is conceivable given that demand for both renewable energy and oil and gas development increase when the price of energy increases. It is also worth noting that the high acreage of ROW exclusion areas under Alternative B (2,480,876 acres versus 394,940 acres under Alternative A) could have a dampening effect on projects on both BLM and non-BLM land by making development of power transmission lines from wind development areas difficult.

Some changes to livestock grazing practices on BLM-administered lands would occur under any of the alternatives. It is unlikely that any of the alternatives would result in large changes in the number of animal unit months (AUM) available for livestock grazing. Marginal changes in available AUMs can probably be accommodated or made up for on other lands in the socioeconomic study area. However, broader factors in the region (e.g. changing availability and cost of private grazing lands) and market forces create economic stress for some livestock grazing operators. If changes in AUM availability disproportionately affect some

operators, those changes in combination with other economic pressures could impact the viability of those particular operations.

Many recreation attractions besides BLM-administered land generate economic activity in the socioeconomic study area. Other attractions include Flaming Gorge National Recreation Area, National Forest lands, the Seedskadee National Wildlife Refuge, Scenic and Historic Byways, and state parks, wildlife habitat management areas, and public access areas. Management of all these areas, along with management of BLM-administered land, potentially affects the recreation economy. However, broader economic forces are typically much more important drivers than management actions, excepting outright closures of sites. Visitation levels are affected by economic factors such as gasoline prices (which affects local and regional travel), airfares and the value of the dollar (which affect foreign travel), and general consumer confidence in the economy, which affects willingness to spend money on travel and recreational activities. Nonetheless, cumulative loss of scenic open space due to oil and gas development on BLM-administered land and other public and private lands across the socioeconomic study area could impact some recreation-based economic activity by causing some people to move their recreation activities to other, less-impacted areas.

## **T.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

NEPA §102(2)C requires a discussion of any irreversible or irretrievable commitments of resources that would be involved in the proposal should it be implemented. An irretrievable commitment of a resource is one in which the resource or its use is lost for a period of time (e.g., extraction of any locatable mineral ore or fluid mineral). An irreversible commitment of a resource is one that cannot be reversed (e.g., the extinction of a species or disturbance to protected cultural resources).

Implementation of the Rock Springs RMP would allow for surface disturbing activities, including mineral and energy development and infrastructure development that would result in irreversible or irretrievable commitments of resources. These surface disturbing activities would result in long-term or permanent alterations to soil, removal of vegetation cover, fragmentation of wildlife habitat, and damage to cultural and paleontological resources. Wildlife dependent on the affected habitats may be displaced and populations may be reduced as the carrying capacity of the range is reduced. Increases in sediment, salinity, and nonpoint source pollution that result from these activities could result in degradation of water quality and an irretrievable loss of water utility, aquatic habitats, and aquatic-dependent species. However, management prescriptions and mitigation prescribed under the alternatives are intended to reduce the magnitude of these impacts by preventing habitat loss in some areas and reclaiming soil, vegetation, and habitat resources. Although reclamation of some disturbed sites would occur, the level of habitat diversity and quality that existed prior to disturbance would likely not be achieved for several decades and may never return to pre-disturbance conditions. This would likely result in permanent reductions in wildlife populations and impairment of water quality and vegetation communities in some areas.

An irretrievable commitment of nonrenewable fossil fuels (i.e., oil and gas) would occur from the development of wells and subsequent extraction of fluid minerals over the next 20 years. The number of additional wells proposed for development within the planning area ranges from fewer than baseline to 146 depending on the alternative.

### T.3 UNAVOIDABLE ADVERSE IMPACTS

NEPA §102(2)C requires disclosure of any adverse environmental effects that cannot be avoided should the RMP be implemented. Unavoidable adverse impacts are those that remain following the implementation of mitigation measures or impacts for which there are no mitigation measures. Some unavoidable adverse impacts would occur as a result of implementing the Rock Springs RMP.

Continuing to allow surface disturbing activities would result in unavoidable adverse impacts. Although these impacts would be mitigated to the extent possible, unavoidable damage is inevitable. Permanent conversion of vegetation resources to other uses, such as mineral and energy development reduces the quantity and quality of vegetation resources. Energy and mineral development activities on public lands create long-term visual intrusions, soil erosion and compaction, habitat degradation and fragmentation, and water quality impairment. Portions of the planning area with more intense recreational use would continue to experience scarring, increased soil erosion, loss of vegetation, and degradation of water and wildlife resources. Although these impacts are unavoidable, they are generally concentrated in areas that are already disturbed, which limits the spread of impacts on more remote or less frequented areas.

Development of the additional oil and gas wells would cause air quality related impacts. Under all alternatives, production and release into the atmosphere of HAPs, volatile organic compounds (VOC), CO, SO<sub>2</sub>, NO<sub>x</sub>, and PM<sub>10</sub> would increase. However, it is not anticipated that the concentrations of these substances would increase to the point where an exceedance of the NAAQS or WAAQS would occur. Although it is not anticipated that the concentrations of these substances would increase to the point where an exceedance of the NAAQS or WAAQS would occur, the increases over the low historical background concentrations would be noticeable and/or visible to the average person. Impacts would persist as long as development continued, unless improved methods for controlling and/or treating emissions were developed. These impacts would be apparent throughout the planning area and potentially throughout the CIAA for air quality.

Because large portions of the crucial big game habitats coincide with leased areas of oil and gas potential, impacts on wildlife habitat would be unavoidable. Although oil and gas well sites and their associated infrastructure would be mitigated to the extent possible (Appendix B) and BMPs would be employed (Appendix A), long-term and possibly permanent habitat degradation and displacement of wildlife populations would be unavoidable. In addition, competition is anticipated for forage resources among wildlife and livestock. The extent of these impacts would vary by location of development activities, season, and drought cycle.

Inadvertent damage and/or destruction of cultural and paleontological resources from increased visitation and surface-disturbing activities would be unavoidable. Although mitigation measures would include identification and mitigation of resources prior to surface disturbing activities, some unanticipated discoveries of unknown cultural and paleontological resources could occur. The number of sites anticipated to be inadvertently damaged is unknown.

Conflicts between user types such as recreationists who seek more primitive types of recreation and motorized users who share those recreational areas are unavoidable adverse impacts. As recreation demand increases, recreational use would disperse to other areas of the planning area, which could create conflicts with other existing uses of those areas. Recreation use would be displaced from areas of intense mineral development, which will increase the extent and frequency of conflict between these incompatible user groups in other areas.

Numerous land use restrictions imposed throughout the planning area to protect sensitive resources and other important values would impact the ability of operators, individuals, and groups to use the public lands

without limitations and result in forgone opportunities to use resources within the planning area. Although attempts would be made to minimize these impacts by limiting the level of protection necessary to accomplish management objectives and by providing alternative use areas for impacted activities, unavoidable adverse impacts would occur.

## **T.4 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES AND LONG-TERM PRODUCTIVITY**

NEPA §102(C) requires discussion of the relationship between local, short-term uses of the human environment and the maintenance and enhancement of long-term productivity of resources.

Any use of the natural resources within the planning area is likely to adversely impact long-term productivity of these natural resources. The short-term uses that would result in the greatest impact on long-term productivity include mineral and energy development, dispersed recreation, forest harvest, livestock grazing, and infrastructure development. These uses result in surface-disturbing and other disruptive activities that remove vegetation, increase soil erosion and compaction, create visual intrusions and landscape alterations, increase noise, impair water quality, and degrade and fragment wildlife habitat. Although management actions, BMPs, surface use restrictions, and lease stipulations are intended to minimize the effect of short-term uses, some impact on long-term productivity of resources would occur regardless of management approach. Given this situation, the BLM will strive to achieve the most effective and practicable balance between short-term uses and long-term productivity through science-based and flexible management, application of mitigation measures and BMPs, monitoring, continuous evaluation of current management policies and practices, and revision of management prescriptions where necessary and feasible.

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# APPENDIX U—COMPARATIVE SUMMARY OF IMPACTS

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## U.1 COMPARATIVE SUMMARY OF IMPACTS

Table U-1 briefly summarizes the impacts of the actions proposed under each alternative, organized by resource management program. A detailed discussion of the environmental consequences of the actions proposed under each alternative is presented in Chapter 4. Tables 2-3 through 2-12 are in Appendix V.

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**Table U-1. Summary of Impacts, by Resource**

Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<b>Impacts to Air Quality</b>			
<p>The following increases in emissions have the potential to occur from implementation of the management actions included in Alternative A:</p> <ul style="list-style-type: none"> <li>PM<sub>10</sub> could increase by 6,740 tons per year in the mid-year (year 10)</li> <li>PM<sub>10</sub> could increase by 13,638 tons per year in the long-year (year 20)</li> <li>PM<sub>2.5</sub> could increase by 802 tons per year in the mid-year (year 10)</li> <li>PM<sub>2.5</sub> could increase by 1,633 tons per year in the long-year (year 20)</li> <li>NO<sub>x</sub> could increase by 6,421 tons per year in the mid-year (year 10)</li> <li>NO<sub>x</sub> could increase by 13,524 tons per year in the long-year (year 20)</li> <li>SO<sub>2</sub> could increase by six tons per year in the mid-year (year 10)</li> <li>SO<sub>2</sub> could increase by 13 tons per year in the long-year (year 20)</li> <li>CO could increase by 5,364 tons per year in the mid-year (year 10)</li> <li>CO could increase by 11,234 tons per year in the long-year (year 20)</li> <li>VOC could increase by 21,839 tons per year in the mid-year (year 10)</li> <li>VOC could increase by 45,999 tons per year in the long-year (year 20)</li> <li>HAPs could increase by 788 tons per year in the mid-year (year 10)</li> <li>HAPs could increase by 1,651 tons per year in the long-year (year 20)</li> <li>CO<sub>2</sub> could increase by 1,188,241 tons per year in the mid-year (year 10)</li> </ul>	<p>The following increases in emissions have the potential to occur from implementation of the management actions included in Alternative B:</p> <ul style="list-style-type: none"> <li>PM<sub>10</sub> could increase by 1,808 tons per year in the mid-year (year 10)</li> <li>PM<sub>10</sub> could increase by 3,275 tons per year in the long-year (year 20)</li> <li>PM<sub>2.5</sub> could increase by 209 tons per year in the mid-year (year 10)</li> <li>PM<sub>2.5</sub> could increase by 385 tons per year in the long-year (year 20)</li> <li>NO<sub>x</sub> could increase by 1,371 tons per year in the mid-year (year 10)</li> <li>NO<sub>x</sub> could increase by 2,864 tons per year in the long-year (year 20)</li> <li>SO<sub>2</sub> could increase by one ton per year in the mid-year (year 10)</li> <li>SO<sub>2</sub> could increase by three tons per year in the long-year (year 20)</li> <li>CO could increase by 1,176 tons per year in the mid-year (year 10)</li> <li>CO could increase by 2,412 tons per year in the long-year (year 20)</li> <li>VOC could increase by 4,652 tons per year in the mid-year (year 10)</li> <li>VOC could increase by 9,732 tons per year in the long-year (year 20)</li> <li>HAPs could increase by 175 tons per year in the mid-year (year 10)</li> <li>HAPs could increase by 356 tons per year in the long-year (year 20)</li> <li>CO<sub>2</sub> could increase by 260,020 tons per year in the mid-year (year 10)</li> </ul>	<p>The following increases in emissions have the potential to occur from implementation of the management actions included in Alternative C:</p> <ul style="list-style-type: none"> <li>PM<sub>10</sub> could increase by 7,289 tons per year in the mid-year (year 10)</li> <li>PM<sub>10</sub> could increase by 14,825 tons per year in the long-year (year 20)</li> <li>PM<sub>2.5</sub> could increase by 862 tons per year in the mid-year (year 10)</li> <li>PM<sub>2.5</sub> could increase by 1,762 tons per year in the long-year (year 20)</li> <li>NO<sub>x</sub> could increase by 6,630 tons per year in the mid-year (year 10)</li> <li>NO<sub>x</sub> could increase by 13,985 tons per year in the long-year (year 20)</li> <li>SO<sub>2</sub> could increase by seven tons per year in the mid-year (year 10)</li> <li>SO<sub>2</sub> could increase by 14 tons per year in the long-year (year 20)</li> <li>CO could increase by 5,570 tons per year in the mid-year (year 10)</li> <li>CO could increase by 11,679 tons per year in the long-year (year 20)</li> <li>VOC could increase by 22,529 tons per year in the mid-year (year 10)</li> <li>VOC could increase by 47,471 tons per year in the long-year (year 20)</li> <li>HAPs could increase by 819 tons per year in the mid-year (year 10)</li> <li>HAPs could increase by 1,716 tons per year in the long-year (year 20)</li> <li>CO<sub>2</sub> could increase by 1,228,583 tons per year in the mid-year (year 10)</li> </ul>	<p>The following increases in emissions have the potential to occur from implementation of the management actions included in Alternative D:</p> <ul style="list-style-type: none"> <li>PM<sub>10</sub> could increase by 6,981 tons per year in the mid-year (year 10)</li> <li>PM<sub>10</sub> could increase by 14,046 tons per year in the long-year (year 20)</li> <li>PM<sub>2.5</sub> could increase by 826 tons per year in the mid-year (year 10)</li> <li>PM<sub>2.5</sub> could increase by 1,672 tons per year in the long-year (year 20)</li> <li>NO<sub>x</sub> could increase by 6,365 tons per year in the mid-year (year 10)</li> <li>NO<sub>x</sub> could increase by 13,433 tons per year in the long-year (year 20)</li> <li>SO<sub>2</sub> could increase by six tons per year in the mid-year (year 10)</li> <li>SO<sub>2</sub> could increase by 13 tons per year in the long-year (year 20)</li> <li>CO could increase by 5,347 tons per year in the mid-year (year 10)</li> <li>CO could increase by 11,200 tons per year in the long-year (year 20)</li> <li>VOC could increase by 21,657 tons per year in the mid-year (year 10)</li> <li>VOC could increase by 45,594 tons per year in the long-year (year 20)</li> <li>HAPs could increase by 787 tons per year in the mid-year (year 10)</li> <li>HAPs could increase by 1,645 tons per year in the long-year (year 20)</li> <li>CO<sub>2</sub> could increase by 1,180,497 tons per year in the mid-year (year 10)</li> </ul>



Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<ul style="list-style-type: none"> <li>CO<sub>2</sub> could increase by 2,486,790 tons per year in the long-year (year 20)</li> <li>CH<sub>4</sub> could increase by 12,912 tons per year in the mid-year (year 10)</li> <li>CH<sub>4</sub> could increase by 26,963 tons per year in the long-year (year 20)</li> <li>N<sub>2</sub>O could increase by 17 tons per year in the mid-year (year 10)</li> <li>N<sub>2</sub>O could increase by 35 tons per year in the long-year (year 20).</li> </ul>	<ul style="list-style-type: none"> <li>CO<sub>2</sub> could increase by 533,159 tons per year in the long-year (year 20)</li> <li>CH<sub>4</sub> could increase by 2,889 tons per year in the mid-year (year 10)</li> <li>CH<sub>4</sub> could increase by 5,851 tons per year in the long-year (year 20)</li> <li>N<sub>2</sub>O could increase by four tons per year in the mid-year (year 10)</li> <li>N<sub>2</sub>O could increase by eight tons per year in the long-year (year 20).</li> </ul>	<ul style="list-style-type: none"> <li>CO<sub>2</sub> could increase by 2,573,258 tons per year in the long-year (year 20)</li> <li>CH<sub>4</sub> could increase by 13,457 tons per year in the mid-year (year 10)</li> <li>CH<sub>4</sub> could increase by 28,133 tons per year in the long-year (year 20)</li> <li>N<sub>2</sub>O could increase by 17 tons per year in the mid-year (year 10)</li> <li>N<sub>2</sub>O could increase by 36 tons per year in the long-year (year 20).</li> </ul>	<ul style="list-style-type: none"> <li>CO<sub>2</sub> could increase by 2,470,103 tons per year in the long-year (year 20)</li> <li>CH<sub>4</sub> could increase by 12,924 tons per year in the mid-year (year 10)</li> <li>CH<sub>4</sub> could increase by 26,942 tons per year in the long-year (year 20)</li> <li>N<sub>2</sub>O could increase by 17 tons per year in the mid-year (year 10)</li> <li>N<sub>2</sub>O could increase by 35 tons per year in the long-year (year 20).</li> </ul>
<p>Key to emission abbreviations and acronyms:                      PM: Particulate matter, PM<sub>10</sub>—particles with diameters smaller than 10 micrometers; PM<sub>2.5</sub>—particles with diameters smaller than 2.5 micrometers                      NO<sub>x</sub>: Nitrogen dioxide                      HAP: Hazardous air pollutant                      SO<sub>2</sub>: Sulfur dioxide                      CO<sub>2</sub>: Carbon dioxide                      CO: Carbon monoxide                      CH<sub>4</sub>: Methane                      VOC: Volatile organic compounds                      N<sub>2</sub>O: Nitrous oxide</p>			
<p><b>Impacts to Soil Resources</b></p>			
<p>Soil resources would be impacted by management actions, such as mineral development and associated infrastructure, that remove vegetation and expose the surface to accelerated wind and water erosion. Management of other resources and resource uses such as cultural resources, forest and woodlands, and paleontology would have a minimal impact on erosion.</p> <p>Surface disturbing activities associated with minerals activities would expose soils to wind and water erosion in the short term and long term. Estimated initial surface disturbance from fluid mineral development for Alternative A would be 32,831 acres. Approximately 540,021 acres would be closed to new fluid mineral development.</p>	<p>Impacts to soil resources would be similar to those described under Alternative A. The increased emphasis on protection of natural resources would minimize erosion from surface disturbing activities. Additional protections, closures, and lease stipulations would reduce surface disturbance, vegetation loss, and resulting soil erosion to a greater degree when compared to Alternative A.</p> <p>Surface disturbing activities associated with minerals activities would expose soils to wind and water erosion in the short term and long term. Increased closures and no surface occupancy (NSO) stipulations for oil and gas leasing would provide the greatest protections to soil resources. The estimated initial surface disturbance would be 8,892</p>	<p>Impacts to soil resources would be similar to those described under Alternative A. Fewer protections to natural resources would allow more erosion from surface disturbing activities when compared to Alternative A.</p> <p>Surface disturbing activities associated with minerals activities would expose soils to wind and water erosion in the short term and long term. The estimated initial surface disturbance would be 33,840 acres. Approximately 225,782 acres would be closed to new fluid mineral development.</p> <p>Alternative C would have the greatest impacts to soil resources among all of the alternatives.</p>	<p>Impacts to soil resources would be similar to those described under Alternative A. Fewer protections to natural resources would allow more erosion from surface disturbing activities when compared to Alternative A.</p> <p>Surface disturbing activities associated with minerals activities would expose soils to wind and water erosion in the short term and long term. The estimated initial surface disturbance would be 32,587 acres. Approximately 768,989 acres would be closed to new fluid mineral development.</p> <p>A larger area of land would be closed to mineral development when compared to Alternative A; however, other protections for soil and water resources could allow for overall impacts to soil resources similar to Alternative A.</p>

Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
	<p>acres and over 2.1 million acres would be closed to oil and gas leasing.</p> <p>Alternative B would protect soil resources to the greatest degree when compared to Alternatives A, C, and D.</p>		
<b>Impacts to Water Resources</b>			
<p>Impacts to water resources would result from management actions such as mineral development and associated infrastructure, that would remove and disturb vegetation, expose soils to the erosive forces of water and wind, and altering and accelerating overland flow, resulting in increased transport of sediment, salt, and excess nutrients to water bodies or groundwater sources. Management of other resources and resource uses such as cultural resources, forest and woodlands, and paleontology would have a minimal impact on erosion.</p> <p>Surface disturbing activities associated with minerals activities would expose soils to wind and water erosion in the short term and long term. Estimated initial surface disturbance from fluid mineral development for Alternative A would be 32,831 acres. Approximately 540,021 acres would be closed to new fluid mineral development which would provide protections to water resources in those areas.</p> <p>Management specific for water resources under Alternative A would provide protections to surface and groundwater from sediment, nutrient and chemical inputs, and increased streamflows. The management would</p>	<p>Impacts to water resources would be similar to those described under Alternative A. The increased emphasis on protection of natural resources would minimize soil loss, erosion, and runoff into water bodies from surface disturbing activities. Additional protections, closures, and lease stipulations would reduce surface disturbance, vegetation loss, soil erosion, and degradation of water resources to a greater degree when compared to Alternative A.</p> <p>Surface disturbing activities associated with minerals activities would expose soils to wind and water erosion in the short term and long term. Increased closures and NSO stipulations for oil and gas leasing would provide the greatest protections to water resources. The estimated initial surface disturbance would be 8,892 acres and 2,186,218 acres would be closed to oil and gas leasing.</p> <p>Alternative B would protect water resources to the greatest degree when compared to Alternatives A, C, and D.</p>	<p>Impacts to water resources would be similar to those described under Alternative A. Fewer protections to natural resources would allow vegetation removal, exposure of soils to the erosive forces of water and wind, and increased transport of sediment, salt, and excess nutrients to water bodies or groundwater sources as a result of surface disturbing activities when compared to Alternative A.</p> <p>Surface disturbing activities associated with minerals activities would expose soils to wind and water erosion in the short term and long term. The estimated initial surface disturbance would be 33,397 acres. Approximately 225,782 acres would be closed to new fluid mineral development.</p> <p>Alternative C would have the greatest impacts to water resources among all of the alternatives.</p>	<p>Impacts to water resources would be similar to those described under Alternative A. Fewer protections to natural resources would allow vegetation removal, exposure of soils to the erosive forces of water and wind, and increased transport of sediment, salt, and excess nutrients to water bodies or groundwater sources as a result of surface disturbing activities when compared to Alternative A.</p> <p>Surface disturbing activities associated with minerals activities would expose soils to wind and water erosion in the short term and long term. The estimated initial surface disturbance would be 31,670 acres. Approximately 768,989 acres would be closed to new fluid mineral development.</p> <p>Larger areas of lands would be closed to mineral development when compared to Alternative A; however, other protections for soil and water resources could allow for overall impacts to water resources similar to Alternative A.</p>

Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
protect water quality, stream channel stability, and overall watershed health.			
<b>Impacts to Lands with Wilderness Characteristics</b>			
<p>Surface-disturbing activities associated with the development of mineral resources, including fluid, solid, locatable, and saleable minerals, within the nine areas determined to contain wilderness characteristics would degrade those characteristics. Such activities occurring on lands with wilderness characteristics would impact both the naturalness and opportunities for solitude and primitive recreation.</p> <p>Naturalness would be degraded or eliminated primarily from increases in human activity, modifications to the landscape, and visual intrusions caused by the construction of roads, well pads, development sites, and other facilities. Opportunities for solitude and primitive recreation would be reduced or eliminated by increases in noise and the presence of people, vehicles, and equipment associated with exploration and development of mineral resources.</p>	<p>Nearly all of the resource uses that could potentially impact lands with wilderness characteristics would be prohibited in these areas, which would eliminate nearly all of the impacts described under Alternative A.</p> <p>All nine areas determined to contain wilderness characteristics would be managed as closed to the leasing, exploration and/or development of fluid, saleable, solid, and locatable minerals, and managed as right-of-way (ROW) exclusion areas.</p>	<p>The impacts on lands with wilderness characteristics resulting from surface disturbing activities would be similar to those presented under Alternative A, except the impacts would increase because the nine areas with wilderness characteristics would not be managed to protect those characteristics. Implementing fewer restrictions on mineral development and other surface disturbing activities designed to protect sensitive natural and cultural resources would result in increased impacts on naturalness and opportunities for solitude within lands with wilderness characteristics.</p>	<p>The impacts on lands with wilderness characteristics resulting from surface disturbing activities would be similar to those presented under Alternative A, except the impacts would decrease, as wilderness characteristics would be considered when authorizing uses within lands with wilderness characteristics. Implementing increased restrictions on mineral development and other surface disturbing activities designed to protect sensitive natural and cultural resources would result in decreased impacts on naturalness and opportunities for solitude within lands with wilderness characteristics.</p>
<b>Impacts to Energy and Minerals</b>			
<b>Fluid Leasable Minerals</b>			
<p>Closing 540,021 acres and applying NSO stipulations on 158,611 acres and controlled surface use (CSU) stipulations on 721,132 acres to fluid mineral development (Table 2-4, Appendix V; Map 2-5) would restrict the area in which development could occur, increase the complexity of mineral operations, slow down the production of fluid minerals,</p>	<p>Closing 2,186,218 acres and applying NSO stipulations on 813,354 acres and CSU stipulations on 99,674 acres to fluid mineral development (Table 2-4, Appendix V; Map 2-6) would restrict the area in which development could occur, increase the complexity of mineral operations, slowdown the production of fluid minerals,</p>	<p>Closing 225,782 acres and applying NSO stipulations on 15,542 acres and CSU stipulations on 215,890 acres to fluid mineral development (Table 2-4, Appendix V; Map 2-7) would restrict the area in which development could occur, increase the complexity of mineral operations, slow down the production of fluid minerals, and ultimately reduce the number of mineral operations.</p>	<p>Closing 768,989 acres and applying NSO stipulations on 2,172 acres and CSU stipulations on 1,238,899 acres to fluid mineral development (Table 2-4, Appendix V; Map 2-8) would restrict the area in which development could occur, increase the complexity of mineral operations, slow down the production of fluid minerals, and ultimately reduce the number of mineral operations.</p>

Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<p>and ultimately reduce the number of mineral operations.</p> <p>Applying timing and distance limitations on 1,840,967 acres would further shorten the season for mineral development and delay access to mineral resources.</p> <p>Under Alternative A, there would be 4,773 federal wells projected over the life of the plan.</p>	<p>and ultimately reduce the number of mineral operations.</p> <p>Applying timing and distance limitations on 713,837 acres would further shorten the season for mineral development and delay access to mineral resources.</p> <p>Under Alternative B, the restrictions described above would reduce the number of wells projected over the life of the plan to 1,292. This alternative would have the greatest impact on fluid mineral leasing and development.</p>	<p>Applying timing and distance limitations on 1,355,485 acres would further shorten the season for mineral development and delay access to mineral resources.</p> <p>Under Alternative C, the restrictions described above would increase the number of wells projected over the life of the plan to 4,919. This alternative would have the least impact on fluid mineral leasing and development.</p>	<p>Applying timing and distance limitations on 1,911,167 acres would further shorten the season for mineral development and delay access to mineral resources.</p> <p>Under Alternative D, the restrictions described above would reduce the number of wells projected over the life of the plan to 4,737.</p>
<b>Solid Leasable Minerals</b>			
<p>Closing 485,964 acres to coal development and closing 727,805 acres to oil shale development (Table 2-7, Appendix V; Map 2-9) would reduce coal mining and oil shale operations and likely reduce coal and oil shale production within the planning area.</p>	<p>Closing 3,735,546 acres to coal development and closing 2,122,282 acres to oil shale development (Table 2-7, Appendix V; Map 2-10) would greatly reduce coal mining and oil shale operations and likely reduce coal and oil shale production within the planning area. This alternative would have the greatest impact on leasable solid mineral leasing and development.</p>	<p>Closing 226,219 acres to coal development and closing 225,965 acres to oil shale development (Table 2-7, Appendix V; Map 2-11) would reduce coal mining and oil shale operations and likely reduce coal and oil shale production within the planning area. This alternative would have the least impact on leasable solid mineral leasing and development.</p>	<p>Closing 610,342 acres to coal development and closing 1,557,520 acres to oil shale development (Table 2-7, Appendix V; Map 2-12) would reduce coal mining and reduce oil shale operations and likely reduce coal and oil shale production within the planning area.</p>
<b>Locatable Minerals</b>			
<p>Pursuing withdrawal of 556,558 acres from mineral entry would eliminate the ability to develop locatable minerals in those areas (Table 2-3, Appendix V; Map 2-1), and could reduce overall production of locatable minerals within the planning area.</p>	<p>Pursuing withdrawal of 1,993,908 acres from mineral entry would eliminate the ability to develop locatable minerals in those areas (Table 2-3, Appendix V; Map 2-2), and could greatly reduce overall production of locatable minerals within the planning area. This alternative would have the greatest impact on locatable mineral development.</p>	<p>Pursuing withdrawal of 234,961 acres from mineral entry would eliminate the ability to develop locatable minerals in those areas (Table 2-3, Appendix V; Map 2-3), and could reduce overall production of locatable minerals within the planning area. This alternative would have the least impact on locatable mineral development.</p>	<p>Pursuing withdrawal of 482,272 acres from mineral entry would eliminate the ability to develop locatable minerals in those areas (Table 2-3, Appendix V; Map 2-4), and could reduce overall production of locatable minerals within the planning area.</p>

Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<b>Saleable Minerals</b>			
Closing 833,719 acres to saleable mineral development (Table 2-8, Appendix V; Map 2-13) would reduce saleable mineral operations and likely reduce saleable mineral production within the planning area.	Closing 2,581,741 acres to saleable mineral development (Table 2-8, Appendix V; Map 2-13) would greatly reduce saleable mineral operations and likely reduce saleable mineral production within the planning area. This alternative would have the greatest impact on saleable mineral development.	Closing 226,421 acres to saleable mineral development (Table 2-8, Appendix V; Map 2-13) would reduce saleable mineral operations and likely reduce saleable mineral production within the planning area. This alternative would have the least impact on saleable mineral development.	Closing 362,009 acres to saleable mineral development (Table 2-8, Appendix V; Map 2-13) would reduce saleable mineral operations and likely reduce saleable mineral production within the planning area.
<b>Trona (sodium)</b>			
Land use restrictions under Alternative A result in the closure of 423,633 acres to trona (sodium) leasing and development (Table 2-7, Appendix V). However, because trona leasing and development generally occur within the Known Sodium Leasing Area (KSLA), located in the southwestern region of the planning area (356,960 acres; Map 3-10), only closures within this area would substantially impact trona leasing and development. Due to the importance of this relatively small area as a major source of the rare sodium carbonate mineral, areas closed to trona leasing and development within the KSLA to protect other resources would cover only 24,458 acres (Map 2-9). Therefore, potentially significant impacts to trona-related activities from the management of other resources would occur only within these closure areas. This would influence the placement of facilities in these areas, potentially increase the cost of developing trona resources, and could result in a reduction in trona resources extracted via mining activities.	Impacts to trona development would be similar to those described under Alternative A, except more areas would be closed to trona leasing and development. Under Alternative B, 49,224 acres would be closed to trona leasing and development within the KSLA (Map 2-10), which represents a 101% increase compared to Alternative A. This would increase the level of impacts to trona development and could result in further reduction of trona extracted via mining activities.	Impacts to trona development would be similar to those described under Alternative A, except fewer areas would be closed to trona leasing and development. Under Alternative C, 24,412 acres would be closed to trona leasing and development within the KSLA (Map 2-11), which represents a 12% decrease compared to Alternative A. This would reduce related impacts to trona mining activities, as more areas would be available for such mining.	Impacts to trona development would be the same as those described under Alternative A. Under Alternative D, 24,290 acres would be closed to trona leasing and development within the KSLA, which represents a <1% decrease compared to Alternative A (Table 2-7, Appendix V, Map 2-12).

Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<b>Impacts to Wildland Fire Ecology and Management</b>			
<p>Wildland fire ecology and management would primarily be impacted by different forms of surface disturbing activities associated with minerals and energy development, which could increase human presence, motor vehicle use, and the use of heavy equipment. This increase in human presence, vehicles, and heavy equipment use could increase additional ignition sources, the probability of wildfire occurrence, and the need for fire suppression activities. Surface disturbing activities could reduce fire fuels loads from vegetation removal, increase fire breaks from roads and clearings as well as improve access for fire suppression activities in these areas. Other activities such as recreation (including special recreation management areas [SRMA]) and off-highway vehicle (OHV) use could increase the risk of accidental fires from campfires, target shooting, and other ignition sources.</p> <p>Overall management for wildland fire based on achieving the most efficient control and allowing historical acres burned to increase could slowly allow natural fire to be introduced into an ecological role in vegetation systems.</p>	<p>Impacts to wildland fire ecology would be similar to those described under Alternative A.</p> <p>Larger areas closed to mineral leasing in addition to not managing SRMAs under Alternative B could reduce the risks of accidental ignitions from human use, vehicles, or machinery. Response to fire and using wildfire for resource benefit would allow fire to function in a more natural ecological role while protecting life or property.</p> <p>Additional management actions for fuels management under this alternative would reducing the amount of fine fuels through prescribed fire and other methods.</p>	<p>Impacts to wildland fire ecology would be similar to those described under Alternative A.</p> <p>Smaller areas of land would be closed to mineral and other development activities, and more SRMAs would be managed under Alternative C. The management would increase human presence, motor vehicle use, and the use of heavy equipment. This increase in human presence, vehicles, and heavy equipment use could increase additional ignition sources, the probability of wildfire occurrence, and the need for fire suppression activities to a greater degree when compared to Alternative A.</p> <p>Wildfire management would emphasize suppression which could reduce the level of fire that could be allowed to play a role in the ecological systems in the planning area.</p>	<p>Impacts to wildland fire would be very similar to those described under Alternative A. Smaller areas of land would be closed to mineral development, but there would be more SRMAs manage under Alternative D. Management of wildland fire ecology would be very similar to Alternative C.</p>
<b>Impacts to Vegetative Communities</b>			
<p>Vegetation and vegetation communities would primarily be impacted by different forms of surface disturbance and disruptive activities, such as mineral and energy development and associated infrastructure, recreation, and OHV use. These activities would result in both short- and long-term impacts to small</p>	<p>Impacts to vegetation from fluid minerals development and associated surface disturbing activities would be reduced compared to Alternative A. Increased emphasis on resource protection would support vegetation communities from additional management to protect native</p>	<p>Impacts to vegetation resources would be similar to those described under Alternative A. Fewer protections to natural resources would allow more surface disturbance, development, and vegetation removal, in addition to less management to protect vegetation resources from damage or infestation</p>	<p>Impacts to vegetation resources would be similar to those described under Alternative A. Slightly fewer protections to natural resources could allow more surface disturbance, development, and vegetation removal when compared to Alternative A.</p>

Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<p>localized areas as well as large areas from the removal or damage of vegetative surface cover and vegetation habitat.</p> <p>These impacts would result in various levels of decreases to plant community health, diversity, and impact habitats that are susceptible to invasive/noxious weeds. Increases in invasive and noxious weeds would result in a decline to native species compromising the overall habitat health (through ecological processes). Impacts to vegetation from fluid minerals development would have 32,831 acres of short-term surface disturbance and 540,021 acres would be closed to new fluid mineral development. BMPs and lease stipulations could support revegetation and restoration of vegetative communities in the long-term.</p>	<p>vegetation from damage, removal, or infestation from invasive, non-native plant species.</p> <p>Short-term surface disturbance from oil and gas leasing would be reduced to 8,892 acres and over 2.1 million acres would be closed to oil and gas development. Additional lease stipulations and best management practices (BMP) could support revegetation and restoration of vegetative communities in the long-term when compared to Alternative A.</p>	<p>from invasive, non-native plant species when compared to Alternative A.</p> <p>Surface disturbing activities associated with minerals activities would remove vegetation in the short term; fewer BMPs and lease stipulations could provide less support to vegetation resources in the long term. The estimated initial surface disturbance would be 33,840 acres. Approximately 225,782 acres would be closed to new fluid mineral development.</p> <p>Alternative C would have the greatest impacts to vegetation resources among all of the alternatives.</p>	<p>Surface disturbing activities associated with minerals activities would remove vegetation and expose areas to invasive, non-native plant species. The estimated initial surface disturbance would be 32,587 acres. Approximately 768,989 acres would be closed to new fluid mineral development.</p> <p>Larger areas of lands would be closed to mineral development when compared to Alternative A; however, overall impacts to vegetation resources would be similar to Alternative A.</p>
<p><b>Impacts to Wildlife and Fisheries</b></p>			
<p>Impacts would result from surface disturbing activities, mineral development, and associated infrastructure (pipelines, power lines, and roads) throughout the planning area, particularly from the removal of sensitive wildlife habitat. Estimated initial surface disturbance from fluid mineral development for Alternative A would be 32,831 acres. Approximately 540,021 acres would be closed to new fluid mineral development.</p> <p>Mineral development would affect wildlife and fisheries through loss, alteration, and fragmentation of habitats and displacement of wildlife. An increase in roads, pipelines, and infrastructure would lead to habitat loss, fragmentation, and changes in surface hydrology.</p>	<p>Under Alternative B, the lowest amount of surface disturbance would be estimated to occur from fluid mineral development. The estimated initial surface disturbance would be 8,892 acres.</p> <p>Closing over 2.1 million acres to oil and gas development, as well as millions of acres of closures for other mineral development would protect the largest amount of lands from surface disturbance and habitat fragmentation.</p> <p>Management to protect natural and cultural resources would support wildlife, fisheries, and habitat for forage, hunting, breeding, migration, and critical seasonal areas.</p>	<p>Alternative C would allow the most fluid mineral development among the alternatives. The estimated initial surface disturbance would be 33,840 acres. Approximately 225,782 acres would be closed to new fluid mineral development.</p> <p>Mineral development would affect wildlife and fisheries through loss, alteration, and fragmentation of habitats and displacement of wildlife. An increase in roads, pipelines, and infrastructure would lead to habitat loss, fragmentation, and changes in surface hydrology. The combined impacts from these actions could lead to significant impacts in localized areas to a greater degree when compared to Alternative A.</p>	<p>Alternative D would result in slightly more surface disturbance from fluid mineral development when compared to Alternative A. The estimated initial surface disturbance would be 32,587 acres. Approximately 768,989 acres would be closed to new fluid mineral development.</p> <p>Mineral development would affect wildlife and fisheries through loss, alteration, and fragmentation of habitats and displacement of wildlife. Construction of roads, pipelines, and infrastructure would lead to habitat loss, fragmentation, and changes in surface hydrology. The combined impacts from these actions could lead to significant impacts in localized areas to a greater degree when compared to Alternative A.</p>

Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<p>Erosion and sediment runoff could affect water quality, streambank stability, and instream habitat quality for fisheries.</p> <p>Additional surface disturbing activities would result from OHV use, recreation, other energy development, ROWs, installation of range improvements, and wildland fire.</p>		<p>Alternative C would have fewer restrictions on other surface disturbing or disruptive activities such as OHV use, ROWs, recreational use, energy development, and installation of range improvements.</p>	<p>degree when compared to Alternative A.</p> <p>Additional surface disturbing activities would result from installation of range improvements, OHV use, recreation, other energy development, ROWs, and wildland fire.</p>
<b>Impacts to Special Status Species</b>			
<p>Impacts to Special Status Species habitat would result from surface-disturbing activities, habitat loss, habitat fragmentation, and human presence from activities such as fluid mineral leasing and development.</p> <p>Estimated initial surface disturbance from fluid mineral development for Alternative A would be 32,831 acres. Approximately 540,021 acres would be closed to new fluid mineral development.</p> <p>Mineral development would affect special status wildlife species through loss, alteration, and fragmentation of habitats and displacement of wildlife. An increase in roads, pipelines, and infrastructure would lead to habitat loss, fragmentation, and changes in surface hydrology. Erosion and sediment runoff could affect water quality, streambank stability, and instream habitat quality for special status fish species.</p> <p>Additional surface disturbing activities would result from OHV use, recreation, other energy development, ROWs, installation of range improvements, and wildland fire.</p> <p>Specific management actions for special status plants and wildlife would support species from direct mortality, habitat</p>	<p>Under Alternative B, the lowest amount of surface disturbance would be estimated to occur from fluid mineral development. The estimated initial surface disturbance would be 8,892 acres.</p> <p>Closing over 2.1 million acres to oil and gas development, as well as millions of acres of closures for other mineral development would protect the largest amount of lands from surface disturbance, soil loss, and habitat fragmentation.</p> <p>Management actions to protect natural and cultural resources would support Special Status Species and their habitat for forage, hunting, breeding, migration, and critical seasonal areas.</p> <p>Specific management actions for special status plants and wildlife would support species from direct mortality, habitat damage or loss, and indirect impacts from chemicals, development, or other damaging actions to a greater degree when compared to Alternative A.</p>	<p>Alternative C would allow the most fluid mineral development among the alternatives. The estimated initial surface disturbance would be 33,840 acres. Approximately 225,782 acres would be closed to new fluid mineral development.</p> <p>Mineral development would affect Special Status Species through loss, alteration, and fragmentation of habitats and displacement of wildlife. An increase in roads, pipelines, and infrastructure would lead to habitat loss, fragmentation, and changes in surface hydrology. Erosion and sediment runoff could affect water quality, streambank stability, and instream habitat quality for special status fish species. The combined impacts from these actions could lead to significant impacts in localized areas to a greater degree when compared to Alternative A.</p> <p>Alternative C would have fewer restrictions on other surface disturbing or disruptive activities such as OHV use, ROWs, recreational use, energy development, and installation of range improvements.</p> <p>Specific management actions for special status plants and wildlife would</p>	<p>Alternative D would result in slightly more surface disturbance from fluid mineral development when compared to Alternative A. The estimated initial surface disturbance would be 32,587 acres. Approximately 768,989 acres would be closed to new fluid mineral development.</p> <p>Mineral development would affect Special Status Species through loss, alteration, and fragmentation of habitats and displacement of wildlife.</p> <p>Construction of roads, pipelines, and infrastructure would lead to habitat loss, fragmentation, and changes in surface hydrology. Erosion and sediment runoff could affect water quality, streambank stability, and instream habitat quality for special status fish species. The combined impacts from these actions could lead to significant impacts in localized areas to a slightly greater degree when compared to Alternative A.</p> <p>Additional surface disturbing activities would result from OHV use, recreation, other energy development, ROWs, installation of range improvements, and wildland fire.</p>



Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<p>damage or loss, and indirect impacts from chemicals, development, or other damaging actions.</p>		<p>support species from direct mortality, habitat damage or loss, and indirect impacts from chemicals, development, or other damaging actions to a greater degree when compared to Alternative A.</p>	<p>Specific management actions for special status plants and wildlife would support species from direct mortality, habitat damage or loss, and indirect impacts from chemicals, development, or other damaging actions to a greater degree when compared to Alternative A.</p>
<p><b>Impacts to Wild Horses</b></p>			
<p>Impacts to wild horses would result from activities where vegetation and forage resources are damaged or removed (e.g., mineral development, ROW development, or recreation). Where lands are closed to mineral development and other surface disturbing activities, forage and water resources would be protected and fewer disturbances from vehicles, machinery and human presence would disrupt herd behavior.</p>	<p>Impacts to wild horses would be similar to those described under Alternative A. Larger areas of land would be closed to mineral development, protecting resources and reducing disturbance to horses within herd management areas.</p>	<p>Impacts to wild horses would be similar to those described under Alternative A, although more land would be open to mineral leasing and development. Increased development activity could lead to greater loss of forage resources and disturbance from human presence compared to Alternative A.</p>	<p>Impacts to wild horses would be similar to those described under Alternative A. More land would be available for mineral development which could lead to greater loss of forage resources and disturbance from human presence compared to Alternative A.</p>
<p><b>Impacts to Cultural Resources</b></p>			
<p>Surface disturbance from oil, gas and other mineral development, ROWs, recreation, and installation of range improvements would cause potential damage to cultural resources in the area. Surface disturbing activities associated with oil and gas development would be closed on 540,021 acres and restricted (NSO stipulations) on 158,611 acres, which could protect cultural resources within these areas. Resource specific management actions would provide cultural resources additional, direct protection of those resources through buffer areas surrounding rock art and other cultural</p>	<p>Impacts to cultural resources would be similar to those described under Alternative A. However, more restrictions for surface disturbing activities would reduce the likelihood of potential damage to cultural resources. Under Alternative B, surface disturbing activities associated with oil and gas development would be closed on 2,186,218 acres and restricted (NSO stipulations) on 813,354 acres, which could protect cultural resources within these areas to a greater degree compared to Alternative A. Resource specific management actions would provide cultural resources additional, direct protection</p>	<p>Impacts to cultural resources would be similar to those described under Alternative A. However, fewer restrictions for surface disturbing activities would increase the likelihood of potential damage to cultural resources. Under Alternative C, surface disturbing activities associated with oil and gas development would be closed on 225,782 acres and restricted (NSO stipulations) on 15,542 acres, which could allow potential damage to cultural resources within these areas to a greater degree compared to Alternative A.</p>	<p>Impacts to cultural resources would be similar to those described under Alternative A. Under Alternative D, surface disturbing activities associated with oil and gas development would be closed on 768,989 acres and restricted (NSO stipulations) on 2,172 acres, which could allow potential damage to cultural resources within these areas to a slightly lesser degree compared to Alternative A. Resource specific management actions would provide cultural resources additional, direct protection of those resources through buffer areas surrounding rock art and other cultural resources as well as other protective management, similar to Alternative A.</p>

Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
resources as well as other protective management.	of those resources through buffer areas surrounding rock art and other cultural resources as well as other protective management. Under Alternative B, larger buffer distances, more restrictions, and inclusion of larger setting areas in rock art and other significant sites would provide the most protection of cultural resources among all alternatives.		
<b>Impacts to Paleontological Resources</b>			
<p>Surface disturbance from oil, gas and other mineral development, ROWs recreation, and installation of range improvements would cause potential damage to undiscovered or undocumented paleontological resources.</p> <p>Surface disturbing activities associated with oil and gas development would be closed on 540,021 acres and restricted (NSO stipulations) on 158,611 acres, which could protect paleontological resources within these areas.</p> <p>Resource specific management actions would provide fossil resources additional, direct protection of those resources through protective management.</p>	<p>Impacts to paleontological resources would be similar to those described under Alternative A. However, more restrictions for surface disturbing activities would reduce the likelihood of potential damage to undiscovered or undocumented paleontological resources.</p> <p>Under Alternative B, surface disturbing activities associated with oil and gas development would be closed on 2,186,218 acres and restricted (NSO stipulations) on 813,354 acres, which could protect paleontological resources within these areas to a greater degree compared to Alternative A.</p> <p>Resource specific management actions would provide fossil resources additional, direct protection of those resources through more protective management under Alternative B, including the prohibition of surface disturbing activities in the Adobe Town and Desolation Flat/Desolation Point areas.</p>	<p>Impacts to paleontological resources would be similar to those described under Alternative A. However, fewer restrictions for surface disturbing activities would increase the likelihood of potential damage to undiscovered or undocumented paleontological resources.</p> <p>Under Alternative C, surface disturbing activities associated with oil and gas development would be closed on 225,782 acres and restricted (NSO stipulations) on 15,542 acres, which could allow potential damage to paleontological resources within these areas to a greater degree compared to Alternative A.</p>	<p>Impacts to paleontological resources would be similar to those described under Alternative A. Under Alternative D, surface disturbing activities associated with oil and gas development would be closed on 768,989 acres and restricted (NSO stipulations) on 2,172 acres, which could allow potential damage to paleontological resources within these areas to a slightly lesser degree compared to Alternative A.</p> <p>Resource specific management actions would provide fossil resources additional, direct protection of those resources through protective management under Alternative D, including consideration of site protection in the Farson Fossil Fish Beds and other significant fossil localities.</p>

Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<b>Impacts to Visual Resources</b>			
<p>Approximately 60% of the planning area would be managed as visual resource management (VRM) Class IV and 17% would be managed as Class III, which would allow for visible surface disturbance to occur over 78% of the landscape. Little to no visible surface disturbance would occur within approximately 22% of lands managed within VRM Classes I and II (6% and 16% respectively). Wells, pipeline corridors, and fugitive dust from facilities and vehicles in otherwise natural areas would lead to changes in the form, line, texture, and color of the landscape where these activities occur.</p>	<p>Alternative B would protect the largest area of lands from visual disruptions from surface disturbances. Approximately 16% of the planning area would be managed as VRM Class IV and 19% would be managed as Class III, which would allow for visible surface disturbance to occur over 35% of the landscape. Little to no visible surface disturbance would occur within approximately 65% of lands managed within VRM Classes I and II (6% and 59% respectively). Wells, pipeline corridors, and fugitive dust from facilities and vehicles in otherwise natural areas would lead to changes in the form, line, texture, and color of the landscape where these activities occur.</p>	<p>Impacts to visual resources would be very similar to those under Alternative A. Approximately 66% of the planning area would be managed as VRM Class IV and 11% would be managed as Class III, which would allow for visible surface disturbance to occur over 77% of the landscape. Little to no visible surface disturbance would occur within approximately 23% of lands managed within VRM Classes I and II (6% and 17% respectively). Wells, pipeline corridors, and fugitive dust from facilities and vehicles in otherwise natural areas would lead to changes in the form, line, texture, and color of the landscape where these activities occur.</p>	<p>Alternative D would protect a much larger area of land from visual disruptions with management under VRM II and much less land managed as VRM IV compared to Alternative A. Approximately 40% of the planning area would be managed as VRM Class IV and 21% would be managed as Class III, which would allow for visible surface disturbance to occur over 61% of the landscape. Little to no visible surface disturbance would occur within approximately 39% of lands managed within VRM Classes I and II (6% and 33% respectively). Wells, pipeline corridors, and fugitive dust from facilities and vehicles in otherwise natural areas would lead to changes in the form, line, texture, and color of the landscape where these activities occur.</p>
<b>Impacts to Livestock Grazing Management</b>			
<p>Impacts to livestock grazing would occur from surface-disturbing and development activities (e.g., mineral development, ROW development) that remove or degrade forage resources. Managing 426,709 acres as ROW exclusion areas, 540,021 acres as unavailable for oil and gas leasing, and 158,611 acres as NSO areas would reduce surface disturbances and help to maintain forage resources.</p>	<p>Impacts to livestock grazing would occur from surface-disturbing and development activities (e.g., mineral development, ROW development) that remove or degrade forage resources. Managing 2,480,876 acres as ROW exclusion areas, 2,186,218 acres as unavailable for oil and gas leasing, and 813,354 acres as NSO areas would reduce surface disturbances and help to maintain forage resources. The impacts would be least intensive under this alternative because of increased restrictions on newly permitted surface disturbing activities within the planning area.</p>	<p>Impacts to livestock grazing would occur from surface-disturbing and development activities (e.g., mineral development, ROW development) that remove or degrade forage resources. Managing 225,784 acres as ROW exclusion areas, 225,782 acres as unavailable for oil and gas leasing, and 15,542 acres as NSO areas would reduce surface disturbances and help to maintain forage resources. The impacts would be greatest under this alternative because of fewer restrictions on newly permitted surface disturbing activities within the planning area.</p>	<p>Impacts to livestock grazing would occur from surface-disturbing and development activities (e.g., mineral development, ROW development) that remove or degrade forage resources. Managing 286,289 acres as ROW exclusion areas, 768,989 acres as unavailable for oil and gas leasing, and 2,172 acres as NSO areas would reduce surface disturbances and help to maintain forage resources.</p>

Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<b>Impacts to Recreation</b>			
<p>Mineral development and other surface disturbing activities could reduce the quality of recreation experiences where roads, trails, and dispersed camping occur. Wells, pipeline corridors, increased road traffic, noise, dust, and the visual impact of facilities in otherwisenatural areas could reduce the quality of some recreation experiences.</p> <p>Approximately 298,110 acres would be managed as SRMAs for the use and enjoyment of recreation such as camping, OHV use, hiking and other outdoor activities. Other areas with special designations such as areas of critical environmental concern (ACEC), National Historic Trails, Wild and Scenic Rivers, and other management areas would provide a range of recreation opportunities from motorized and developed sites, to remote, wilderness experiences.</p>	<p>Under Alternative B, there would be no SRMAs designated and the entire planning area would be an ERMA. There would be fewer designated recreation sites and developed recreation areas, which could reduce the availability of facilities for use by the public. The management could provide opportunities for a more primitive recreation experience in many locations within the planning area. In addition, Alternative B would manage larger areas of viewsheds, and fewer acres of OHV routes. Other areas with special designations such as ACECs, National Historic Trails, National Historic Landmarks, Wild and Scenic Rivers, and other management areas would provide a range of recreation opportunities from motorized use and developed sites, to remote, wilderness experiences.</p>	<p>Impacts to recreation would be similar to those described under Alternative A; however, 592,800 acres would be managed as SRMAs. Management focused on recreation and the benefits of those who use the planning area for recreational activities would provide a wide range of experiences for recreationists. Some SRMAs would provide OHV activities and developed recreation sites, and others would provide a more primitive, remote experience, depending on the area and resources available. Overall, there would be less protection for viewsheds under Alternative C and more surface disturbance would be allowed throughout the planning area from mineral development. The management could diminish the experience of remoteness and solitude compared to Alternative A.</p>	<p>Impacts to recreation would be similar to those described under Alternative A; however, 135,549 acres would be managed as SRMAs. Management focused on recreation and the benefits of those who use the planning area for recreational activities would provide a wide range of experiences for recreationists. Some SRMAs would provide OHV activities and developed recreation sites, and others would provide a more primitive, remote experience, depending on the area and resources available. Less protection of viewsheds and increased surface disturbance could diminish the experience of remoteness and solitude compared to Alternative A.</p>
<b>Impacts to Forest and Woodlands Resources</b>			
<p>Impacts to forestry and woodlands resources would mostly occur from surface disturbing activities. Surface disturbing activities could reduce forest/woodland health through vegetation removal, soil compaction, soil removal, fractured vegetation communities, modified plant community structure and diversity, increased soil erosion, and increased surface runoff.</p> <p>This reduction in forest and woodland health could lead to an increase in invasive/noxious species establishment/proliferation and a reduction in timber production.</p> <p>Fire suppression activities could impact forest resources by contributing to the build-up of fuels, which would increase the potential for fire to destroy these resources. However, fuel reduction</p>	<p>Impacts to forestry and woodlands resources would be very similar to those described under Alternative A.</p> <p>Minerals development and surface disturbing activities that do occur in woodland/forest areas are more likely to occur in areas that have high potential for fluid minerals. Surface disturbing impacts to forestry resources from fluid minerals development are expected to occur across 8,892 acres in the short-term and 2,566 acres in the long-term under Alternative B, most of which would be outside timber production and harvest areas.</p>	<p>Impacts to forestry and woodlands resources would be very similar to those described under Alternative A.</p> <p>Minerals development and surface disturbing activities that do occur in woodland/forest areas are more likely to occur in areas that have high potential for fluid minerals. Surface disturbing impacts to forestry resources from fluid minerals development are expected to occur across 33,397 acres in the short-term and 9,630 acres in the long-term under Alternative C, most of which would be outside timber production and harvest areas.</p>	<p>Impacts to forestry and woodlands resources would be very similar to those described under Alternative A.</p> <p>Minerals development and surface disturbing activities that do occur in woodland/forest areas are more likely to occur in areas that have high potential for fluid minerals. Surface disturbing impacts to forestry resources from fluid minerals development are expected to occur across 31,670 acres in the short-term and 9,132 acres in the long-term under Alternative D, most of which would be outside timber production and harvest areas.</p>

Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<p>projects, as well as some commercial harvesting, could reduce this potential impact by reducing the intensity of wildfires and making wildfire easier to control.</p> <p>Minerals development and surface disturbing activities that do occur in woodland/forest areas are more likely to occur in areas that have high potential for fluid minerals. Surface disturbing impacts to forestry resources from fluid minerals development are expected to occur across 32,831 acres in the short-term and 9,466 acres in the long-term under Alternative A, most of which would be outside timber production and harvest areas.</p>			
<b>Impacts to Lands and Realty</b>			
<p>Impacts on lands and realty management would result from placing restrictions on the location of ROWs and land tenure adjustments. Prohibiting or restricting surface disturbing activities and managing lands as ROW exclusion and avoidance areas could result in the relocation or redesign of proposed ROWs or could preclude the development of some ROWs that could not be effectively mitigated or located in other areas. Land use restrictions that result in the relocation or redesign of proposed ROWs would increase management efforts and costs related to proposals submitted by ROW applicants. ROW exclusion and avoidance areas would include 426,709 and 736,138 acres, respectively.</p>	<p>Impacts on lands and realty management would be similar to those identified under Alternative A, except the impacts would be more extensive with an increase in ROW exclusion areas.</p> <p>ROW exclusion and avoidance areas would include 2,480,876 and 133,903 acres, respectively.</p>	<p>Impacts on lands and realty management would be similar to those identified under Alternative A, except the impacts would be less extensive with a decrease in ROW exclusion and avoidance areas.</p> <p>ROW exclusion and avoidance areas would include 1225,784 and 31,018 acres, respectively.</p>	<p>Impacts on lands and realty management would be similar to those identified under Alternative A, except the impacts would be less extensive with a decrease in ROW exclusion areas.</p> <p>ROW exclusion and avoidance areas would include 286,289 and 1,388,618 acres, respectively.</p>

Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<b>Impacts to Renewable Energy</b>			
<p>Implementing restrictions on surface-disturbing activities and specifically on ROW development would limit the ability to develop renewable energy resources. Designating 426,709 acres as ROW exclusion areas would prohibit renewable energy development in these areas. Designating 736,138 acres as ROW avoidance areas would limit renewable energy development in these areas and could result in the redesign or relocation of renewable energy facilities.</p>	<p>Implementing restrictions on surface-disturbing activities and specifically on ROW development would limit the ability to develop renewable energy resources. Designating 2,480,876 acres as ROW exclusion areas would prohibit renewable energy development in these areas. Designating 133,903 acres as ROW avoidance areas would limit renewable energy development in these areas and could result in the redesign or relocation of renewable energy facilities. This alternative would have the greatest impact on renewable energy development.</p>	<p>Implementing restrictions on surface-disturbing activities and specifically on ROW development would limit the ability to develop renewable energy resources. Designating 225,784 acres as ROW exclusion areas would prohibit renewable energy development in these areas. Designating 31,018 acres as ROW avoidance areas would limit renewable energy development in these areas and could result in the redesign or relocation of renewable energy facilities. This alternative would have the least impact on renewable energy development.</p>	<p>Implementing restrictions on surface-disturbing activities and specifically on ROW development would limit the ability to develop renewable energy resources. Designating 286,289 acres as ROW exclusion areas would prohibit renewable energy development in these areas. Designating 1,388,618 acres as ROW avoidance areas would limit renewable energy development in these areas and could result in the redesign or relocation of renewable energy facilities.</p>
<b>Impacts to Special Designations</b>			
<p>Maintaining the designation of ten ACECs, totaling 286,470 acres, will ensure special management attention is generated to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, and other natural systems or processes.</p> <p>Maintaining the designation of six management areas, totaling 580,010 acres, would continue the application of special management to protect the sensitive resources for which these areas were established.</p> <p>Maintaining the designation of 13 wilderness study areas (WSA), totaling 227,960 acres, would serve to preserve wilderness characteristics by implementing the Interim Management Policy so as not to impair the suitability of such areas for designation by Congress as wilderness. Resource uses</p>	<p>The potential impacts to special designations would be the same as those presented under Alternative A, except they would occur over a larger area for ACECs and thereby offer greater protections to important historic, cultural, wildlife, and scenic values in these areas. The acres designated as ACECs would increase greatly to 1,605,660 (460% increase) and extend to 16 ACECs compared with Alternative A. The areas designated as management areas would decrease to 183,938 acres (68% decrease) compared with Alternative A. However, because most of the areas representing this 68% decrease would be designated as ACECs, the overall level of protection of historic, cultural, wildlife, and scenic values would actually increase. The potential impacts to WSAs and WSRs</p>	<p>The potential impacts to WSAs would be the same as those presented under Alternative A. The impacts on all other special designations discussed under Alternative A above would not occur, as the designations for ACECs, management areas, and WSRs would be eliminated under Alternative C.</p>	<p>The potential impacts to special designations would be the same as those presented under Alternative A, except they would occur over a smaller area for ACECs and thereby offer fewer protections to important historic, cultural, wildlife, and scenic values in these areas. The acres designated as ACECs would decrease to 246,634 acres, which represents a 13.9% decrease compared with Alternative A. The areas designated as management areas would decrease to 312,980 acres (46% decrease) compared with Alternative A). The potential impacts to WSAs and WSRs would be the same as those presented under Alternative A.</p>

Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<p>that could impair the WSA’s wilderness characteristics would not be allowed to occur.</p> <p>Maintaining the designation of 9.7 miles of rivers as Wild (5.8 miles), Scenic (0.5 miles), and Recreation (3.4 miles) would provide for the protection of the outstanding remarkable values (e.g., scenic, recreational, geologic, fish and wildlife, historic, cultural, and other similar values) these free-flowing rivers and immediate environments possess.</p>	<p>would be the same as those presented under Alternative A.</p>		
<b>Impacts to Socioeconomics</b>			
<p>Continuation of current management of resource uses in the planning area would support continuation of existing socioeconomic trends in the five-county socioeconomic study area. The quantified total economic impacts across the study area through all years from 2016–2031 (present value at a 3% discount rate) in 2014 dollars are estimated at \$29.9 billion (B) of total economic output, \$5.4B of total labor earnings, and \$2.3B of state and local revenues from mineral production (severance, ad valorem, and share of federal mineral royalties). An annual average of 6,157 jobs would be supported. Approximately 79% of earnings and 76% of jobs would be generated by oil and gas development and production. Additional non-quantified market-based economic impacts would occur. Nonmarket values would accrue from resources but would also be negatively impacted if status quo management is unable to prevent degradation of ecosystem or resource conditions. The level of oil and gas</p>	<p>Quantified economic impacts across the entire five-county study area from 2016–2031 (present value) in 2014 dollars are estimated at \$12.6B of total economic output, \$2.3B of total labor earnings, and \$0.8B of local and state revenues from mineral production. An annual average of 2,707 jobs would be supported. Approximately 50% of earnings and 47% of jobs would be generated by oil and gas development and production. Constraints on resource uses are greatest under this alternative and would increase various non-quantified costs to the BLM and to operators. Many ecosystem service nonmarket values would be greatest under this alternative. Accrual of other nonmarket values would vary. Social impacts from stresses on the local economy, public services, and social systems would be lowest under this alternative, but reduced rates of development could also reduce local communities’ abilities to achieve desired levels of development. Habitat and resource conservation</p>	<p>Quantified economic impacts across the entire five-county study area from 2016–2031 (present value) in 2014 dollars are estimated at \$30.6B of total economic output, \$5.5B of total labor earnings, and \$2.3B of local and state revenues from mineral production. An annual average of 6,291 jobs would be supported. Approximately 79% of earnings and 77% of jobs would be generated by oil and gas development and production. Because this alternative facilitates resource development, non-quantified economic costs to operators would be least under this alternative. Ecosystem service nonmarket values would be most adversely impacted by this alternative, while accrual of other nonmarket values would be mixed. Social impacts from stresses on the local economy, public services, and social systems would be highest under this alternative. Habitat and resource conservation stakeholders would find this alternative highly unsatisfactory. Mineral development, renewable energy</p>	<p>Quantified economic impacts across the entire five-county study area from 2016–2031 (present value) in 2014 dollars are estimated at \$29.7B of total economic output, \$5.4B of total labor earnings, and \$2.2B of local and state revenues from mineral production. An annual average of 6,114 jobs would be supported. Approximately 79% of earnings and 76% of jobs would be generated by oil and gas development and production. Alternative D would have non-quantified economic impacts that would be generally similar to Alternative A but for some management aspects would resemble Alternative B or C. Nonmarket values would be similar to Alternative A, but in some cases would be greater due to additional resource protections. Social impacts from stresses on the local economy, public services, and social systems would be similar to Alternative A, but may be somewhat less in some areas. Habitat and resource conservation stakeholders would find this alternative more favorable than</p>

Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<p>development under Alternative A, particularly during “boom” periods, may cause social impacts due to pressures on the local economy, public services, and social systems. Habitat and resource conservation stakeholders would find this alternative unsatisfactory; mineral development and production, renewable energy development, and livestock grazing stakeholders would generally find this alternative conducive to their interests and values; and recreation stakeholders would have mixed views.</p>	<p>stakeholders would find Alternative B the most favorable of all the alternatives for their interests. Mineral development, renewable energy development, and livestock grazing stakeholders would find it the least favorable. Quiet recreation stakeholders would view this alternative favorably but OHV and developed recreation stakeholders would find it least favorable.</p>	<p>development, and livestock grazing stakeholders would find it the most favorable alternative to their interests. Recreation stakeholders would have mixed views opposite to their views of Alternative B: quiet recreation stakeholders would view Alternative C least favorably but OHV and developed recreation stakeholders would find it most favorable.</p>	<p>Alternatives A or C, but less favorable than Alternative B. Relative to Alternative A, mineral development stakeholders would find Alternative D similar, renewable energy development stakeholders would find it similar, and livestock grazing stakeholders would find it similar or slightly less favorable. Quiet and developed recreation stakeholders would find Alternative D more favorable than Alternative A, and OHV recreation stakeholders would find it less favorable.</p>



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## APPENDIX V—CHAPTER 2 ACREAGE TABLES

**Table 2-3. Areas Proposed for Withdrawal from Mineral Location**

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<b>PROPOSED WITHDRAWAL FROM MINERAL LOCATION</b>				
Big Game Migration Corridor Area of Critical Environmental Concern (ACEC)		X		
Big Sandy Openings ACEC		X		
Boars Tusk ACEC		X		
Boars Tusk (90 acres)	X			
Cedar Canyon, LaBarge Bluffs, Tolar, and other significant rock art sites and ½-mile viewshed	X			
Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar, White Mountain Petroglyphs, and other significant rock art sites and three-mile viewshed		X		
Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar, White Mountain Petroglyphs, and other significant rock art sites (viewshed not included)				X
Cedar Canyon ACEC	X			
Crookston Ranch – Jack Morrow Hills (JMH)	X			X
Crookston Ranch ACEC		X		
Elk birthing areas (northern) – JMH	X			
Emmons Cone				X
Four J Basin Portion of the Pine Mountain Management Area	X	X		
Greater Red Creek ACEC		X		
Greater Red Creek ACEC – Currant Creek Watershed	X			
Greater Red Creek ACEC – Red Creek Watershed	X	X		
Greater Sand Dunes ACEC (western portion) – JMH	X			
Greater Sand Dunes ACEC	X			
Boyer Ranch House (formerly LaClede Stage Station) and Dug Springs Stage Station on the Overland Trail	X	X		X
Lands with Wilderness Characteristics		X		
Little Mountain ACEC				X

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Monument Valley ACEC		X		
Monument Valley Management Area	X			
Oregon Buttes ACEC		X		
Pilot Butte				X
Pinnacles ACEC		X		
Pinnacles Geologic Feature	X	X		X
Prehistoric Quarry Sites (48SU1263 and 48SU7632)	X	X		X
Red Lake East Sand Dunes ACEC		X		
Special status plant known locations (limber pine exception)		X		
Special Status Plants ACEC	X	X		X
Steamboat Mountain ACEC		X		
South Pass Historic Landscape ACEC	X	X		X
South Pass Summit – JMH	X			
South Wind River ACEC		X		
Sweetwater Bridge and Guard Station campgrounds	X		X	X
Tri-Territory Marker	X	X	X	X
White Mountain Petroglyphs ACEC	X	X		
Wind River Front Special Recreation Management Area (SRMA) (suitable sites along the river)	X			X
Within five miles of National Historic Trails (NHT)		X		
Within ½ mile of historic roads and trails—including, but not limited to, the Overland Trail, the Cherokee Trail, the Point of Rocks to South Pass Road and other Expansion Era roads and trails. And within five miles of the trails for highly visible projects		X		
Killpecker Sand Dunes SRMA			X	X
Wilderness Study Areas (WSA)	X	X	X	X
Steamboat Mountain ACEC		X		
Little Firehole's Cottonwood Canyon area		X		X
<b>Total Acres</b>	<b>556,558</b>	<b>1,993,908</b>	<b>234,961</b>	<b>482,272</b>

Table 2-4. Fluid Mineral Restrictions

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<b>CLOSED TO FLUID MINERAL LEASING</b>				
Mechanically Mineable Trona Area		X		X
Sweetwater County Growth Management Area		X		X
Boars Tusk ACEC		X		
Cedar Canyon ACEC		X		
Crookston Ranch ACEC		X		
Portions of Little Mountain Area	X	X		
Greater Red Creek ACEC		X		
Greater Red Creek ACEC, Currant Creek Portion		X		
Greater Red Creek ACEC, Red Creek Portion	X	X		
Greater Red Creek ACEC, Salt Wells Portion		X		
Greater Red Creek ACEC, Sage Creek Portion		X		
Greater Red Creek ACEC, Sugarloaf Basin Portion		X		
Greater Sand Dunes ACEC, Eastern portion within Area 3 (6,750 acres) – JMH	X			
JMH Area 3 (127,500 acres)		X		X
JMH Area 3 (92,000 acres)	X			
Killpecker Sand Dunes SRMA				X
Lands with Wilderness Characteristics		X		
Little Mountain ACEC				X
Monument Valley ACEC (federal sections)		X		
Natural Corrals ACEC		X		
National Historic Trails—five miles from each side of the trail.		X		
Pine Springs ACEC		X		
Pinnacles Geographic Area	X			
Pinnacles Geologic Feature (JMH)	X			
South Pass Historic Landscape ACEC		X		
Steamboat Mountain ACEC (less the area that is no surface occupancy (NSO)) – JMH	X			X

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Tri-Territory marker	X	X	X	X
Wild and Scenic River, Wild Classification (½ mile)	X	X		
Wild and Scenic River, Scenic Classification (½ mile)	X	X		
Wild and Scenic River, Recreational Classification (½ mile)	X	X		
Wilderness Study Areas	X	X	X	X
Wind River Front (Eastern Unit)	X	X		X
South Wind River ACEC		X		
Aquifer recharge area for the towns of Superior and McKinnon				X
Red Lake East Sand Dunes ACEC		X		
Big Game Migration Corridor ACEC		X		
<b>Total Acres</b>	<b>540,021</b>	<b>2,186,218</b>	<b>225,782</b>	<b>768,989</b>
<b>NO SURFACE OCCUPANCY (NSO)</b>				
14-Mile Recreation Area	X			
Active raptor nests (within ½ mile)	X			
Active and historic raptor nests (within one mile)		X		
Adobe Town and Desolation Flat/Desolation Point Paleontological sites		X		
Areas of shallow, unconfined aquifers		X		
Big game crucial winter ranges, parturition areas, connectivity corridors and transitional habitats		X		
Big Sandy River and ½-mile buffer (1.5 miles)	X			
Boars Tusk (90 acres)	X	X	X	X
Blue Point, Blue Forest, Adobe Town Rim, Cedar Canyon, the Bozovich site complex, or other areas with high cultural site density		X		
Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar, White Mountain Petroglyphs, and other significant rock art sites, ½-mile viewshed	X			
Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar White Mountain Petroglyphs, and other significant rock art sites				X
Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar White Mountain		X		

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Petroglyphs, and other significant rock art sites, three-mile viewshed				
Little Firehole's Cottonwood Canyon		X		X
Crookston Ranch	X			X
Crookston Ranch + 100-foot buffer	X			
Emmons Cone	X	X	X	X
Four J Basin Portion of Pine Mountain Management Area	X	X		
Portions of Little Mountain Area		X		
Greater Red Creek ACEC, Currant Creek Portion	X			
Greater Sand Dunes ACEC (developed recreation sites and ORV parking lot)	X			
Historic roads and trails: up to two miles on each side of the intact road or trail segment unless the proposed project and its associated impacts are not visible from the road or trail		X		
Within 500 feet of eligible historic roads and trails				X
Indian Gap + 100-foot buffer	X			
JMH Area 3, approximately 35,000 acres along the perimeter	X			
Boyer Ranch House (formerly LaCiede Stage Station) and Dug Springs Stage Station on the Overland Trail	X	X		
Known human burial sites	X	X	X	X
Natural Corrals				X
Natural Corrals ACEC	X			
Oregon Buttes ACEC	X	X		
Pine Mountain escarpment and toe slopes	X			
Pilot Butte	X	X	X	X
Pine Butte	X			
Pine Springs ACEC	X			
Pine Springs				X
Pinnacles Geographic Area along perimeter –within JMH Area 3 (1,200 acres)	X			

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Raptor nesting (occupied nests, cliffs, bluffs, roosts, outcrops and pinnacles)	X			
Riparian areas, wetlands, perennial streams, 100-year floodplains and the area within 1,320 feet (¼ mile) of these areas; and within 500 feet of the edge of the inner gorge of large ephemeral drainages		X		
100-year floodplains, wetlands, and riparian areas	X			
Sensitive resources – JMH	X			
Soils: highly erodible, saline, sodic, saline-sodic, 2:1 clays, and in sand dunes, slopes greater than 25%, soil slumps and creeps, soils sensitive to compaction and/or rutting, and areas that are difficult to reclaim.		X		
South Pass Historic Landscape (area visible within 1-mile buffer of Lander Cutoff and area visible within three-mile buffer of Oregon Trail)	X			
Special Status Plant Species ACEC	X	X		X
Special Status Plant Species – known locations	X			
Within 100 feet of known locations of special status plant species				X
Special Status Plant Species –known and potential habitat (limber pine exception)		X		
Steamboat Mountain ACEC		X		
Sugarloaf Basin Management Area		X		
Wild horse herd viewing area + ½-mile buffer	X	X		
Pine Mountain Management Area, Salt Wells portion		X		
Recreation sites + ¼-mile buffer	X			
Developed recreation sites, ¼ mile				X
Developed recreation sites, three miles or visual horizon		X		
White Mountain Petroglyphs ACEC	X	X		
Big game migration corridors (within ½ mile)		X		
North and South Table Mountains	X			

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Town of Superior water recharge area		X		
Pinnacles Geologic Feature				X
Killpecker Sand Dunes SRMA			X	
Oregon and Mormon Pioneer National Historic Trails SRMA			X	
Wind River Front (Eastern Unit)				
Parting-of-the-Ways Historical Site				X
<b>Total Acres</b>	<b>158,611</b>	<b>813,354</b>	<b>15,542</b>	<b>2,172</b>
<b>CONTROLLED SURFACE USE (CSU)</b>				
ACECs + expansions – JMH	X			
Active raptor nests (within ½ mile)			X	
Areas adjacent to WSAs – JMH	X			
Areas around or adjacent to local communities or occupied dwellings.	X			
Continental Divide Snowmobile Trail, Continental Divide National Scenic Trail, South Pass Cross Country Ski Trail, ¼ mile of trail	X		X	
Continental Divide National Scenic Trail and Connecting Side Trail			X	
Continental Divide Snowmobile Trail, Continental Divide National Scenic Trail, South Pass Cross Country Ski Trail, 5 miles of trails or visual horizon		X		
Dry Sandy Swales	X			
The area within 500 feet of wetlands, riparian areas, and 100-year floodplains and the area within 100 feet of the edge of the inner gorge of intermittent and large ephemeral drainages	X			
Within 100 year floodplains; ¼ mile of wetlands, riparian areas, and perennial streams; 500 feet of the outer edge of wetland/riparian areas or perennial streams; and 100 feet of the edge of the inner gorge of				X



Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
intermittent channels or ephemeral drainages				
Portions of Little Mountain Area		X		
Highly erodible soils	X			X
Historic Roads and Trails within the areas of two to five miles on each side of the intact road or trail segment unless the proposed project and its associated impacts are not visible from the road or trail		X		
JMH Area 3 (127,500 acres)				
Mechanically Mineable Trona Area			X	
Monument Valley	X			
National Historic Trails—within five to 15 miles from each side of the trail		X		
Pine Mountain	X			
Pine Mountain Management Area	X			X
Prehistoric Quarry Sites (48SU1263 and 48SU7632)	X	X		
Red Desert Watershed Management Area – JMH	X			
Red Desert Management Area				X
Sage Creek Watershed	X			
Slopes greater than 25%	X			
Slopes > 20% – JMH	X			
Some basin big sagebrush/lemon scurfpea areas along the base of Steamboat Mountain	X	X		X
South Pass Historic Landscape (area not visible within 1-mile buffer of Lander Cutoff and area not visible within three-mile buffer of Oregon Trail)	X			
South Pass Historic Landscape ACEC				X
Special status plant species potential habitat – JMH	X			
Steamboat Mountain Crucial Overlap	X			
Steamboat Mountain Management Area – JMH	X			
Aquifer recharge area for the towns of Superior and McKinnon			X	
View from Fontenelle Reservoir	X			

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Visual Resource Management (VRM) Class II Lands	X			
Portion of White Mountain – JMH	X			
Wild and Scenic Rivers (all classifications)				X
Wind River Front (Western Unit)	X	X		
Within ¼ mile of Sweetwater River (Recreational part, 3.4 miles)	X			
Within ¼ mile of the Overland and Cherokee Trails				X
National Trail Management Corridor (5 miles)				X
Areas with low reclamation potential (as per Natural Resources Conservation Service soil rating)				X
Raptor nests: <ul style="list-style-type: none"> <li>• Ferruginous hawk – 0.5 miles</li> <li>• Bald eagle – one mile</li> <li>• Golden eagle – 0.25 miles</li> <li>• Burrowing owl – 0.25 miles</li> <li>• General raptor – 0.25 miles</li> </ul>				X
Big Game Migration Corridor				X
Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar, and White Mountain Petroglyphs viewsheds, ½-mile setting buffer (excluding sites)				X
JMH Area 2	X	X		X
Steamboat Mountain ACEC				
Sugarloaf Basin Management Area	X			X
Boyer Ranch House (formerly LaCleda Stage Station) and Dug Springs Stage Station on the Overland Trail				X
Farson Fossil Fish Beds				X
<b>Total Acres</b>	<b>721,132</b>	<b>99,674</b>	<b>215,890</b>	<b>1,238,899</b>
<b>SEASONAL RESTRICTIONS</b>				
Big Game Crucial Winter Range (November 15 to April 30)	X	X	X	X
Big Game Birthing Areas (May 1 to June 30)	X	X	X	X
Elk Calving Areas	X			

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Eastern Portion of the Greater Sand Dunes Area—crucial big game winter ranges, big game birthing areas, and winter concentration areas	X	X		
Fisheries: ¼-mile riparian area buffer, March 15 to July 31 and September 15 to November 30		X		
Mountain plover aggregation areas (¼-mile buffer; April 10-July 10)	X	X		
Mountain plover aggregation areas (100-foot buffer; April 10-July 10)			X	
Mountain plover active nests (¼-mile buffer; April 10-July 10)				X
Raptor nests (occupied) ½ to 1-mile buffer	X			
Raptor nests: active, historic and associated feeding grounds, two-mile buffer		X		
Raptor nests: active and historic, ¼- to 2 ½-mile buffer				X
Raptor nests (occupied), ½-mile buffer			X	
Steamboat Mountain ACEC—Elk and mule deer crucial winter and parturition habitats, raptor nesting and associated feeding areas		X		
<b>Total Acres</b>	<b>1,840,967</b>	<b>713,837</b>	<b>1,355,485</b>	<b>1,911,167</b>

Table 2-5 shows the number of acres of Bureau of Land Management (BLM) mineral estate that is subject to leasing restrictions for conventional oil and gas exploration and development. The acreage values provided in the table are organized by the type and level of restriction and mineral potential.

**Table 2-5. Areas of Fluid Mineral Lease Conditional Requirements by Hydrocarbon Potential (Approximate Federal Subsurface Acres) for Conventional Oil and Gas**

Fluid Mineral Lease Conditional Requirement	Hydrocarbon Development Potential (acres)						Total <sup>3</sup>
	None	Very Low	Low	Moderate	High	Very High	
<b>ALTERNATIVE A (NO ACTION ALTERNATIVE)</b>							
Available for Leasing, Subject to the Terms and Conditions of the Standard Lease Form	66	387,459	221,982	110,226	68,161	80,733	<b>868,628</b>
Available for Leasing, Subject to Moderate Constraints <sup>1</sup>	68,574	1,201,635	287,918	127,012	58,656	234,306	<b>1,978,101</b>
Available for Leasing, Subject to Major Constraints <sup>1</sup>	57,812	282,908	76,642	54,646	17,260	29,051	<b>518,318</b>
Closed to Leasing <sup>2</sup>	104,413	217,728	8,215	5,583	0	0	<b>335,939</b>
<b>ALTERNATIVE B</b>							
Available for Leasing, Subject to the Terms and Conditions of the Standard Lease Form	0	165,024	63,561	26,299	7,534	5,010	<b>267,428</b>
Available for Leasing, Subject to Moderate Constraints <sup>1</sup>	0	53,771	23,876	18,217	15,338	16,228	<b>127,431</b>
Available for Leasing, Subject to Major Constraints <sup>1</sup>	18	418,417	222,357	70,341	34,852	69,621	<b>815,607</b>
Closed to Leasing <sup>2</sup>	230,847	1,452,518	284,961	182,609	86,354	253,231	<b>2,490,520</b>
<b>ALTERNATIVE C</b>							
Available for Leasing, Subject to the Terms and Conditions of the Standard Lease Form	14,795	848,588	395,278	194,288	83,947	126,804	<b>1,663,700</b>
Available for Leasing, Subject to Moderate Constraints <sup>1</sup>	206,197	1,171,316	189,839	97,540	57,547	206,197	<b>1,929,044</b>
Available for Leasing, Subject to Major Constraints <sup>1</sup>	9,465	69,749	9,639	5,638	2,582	11,089	<b>108,163</b>

Fluid Mineral Lease Conditional Requirement	Hydrocarbon Development Potential (acres)						Total <sup>3</sup>
	None	Very Low	Low	Moderate	High	Very High	
Closed to Leasing <sup>2</sup>	0	79	0	0	0	0	79
<b>ALTERNATIVE D</b>							
Available for Leasing, Subject to the Terms and Conditions of the Standard Lease Form	1	403,441	211,358	100,549	45,638	56,762	817,748
Available for Leasing, Subject to Moderate Constraints <sup>1</sup>	129,725	1,408,399	342,160	166,788	95,046	276,239	2,418,296
Available for Leasing, Subject to Major Constraints <sup>1</sup>	101,140	64,944	9,176	5,726	2,579	11,089	194,654
Closed to Leasing <sup>2</sup>	32,062	213,007	32,062	24,404	815	0	270,287

<sup>1</sup>All activities would be subject to intensive mitigation, including offsite placement of facilities; remote control monitoring; restricted or prohibited surface use, including road construction; multiple wells from a single pad; central tank batteries and facilities; pipelines and power lines concentrated in specific areas; etc., based on site-specific analysis. Moderate constraints include CSU stipulations. Major constraints include NSO stipulations.

<sup>2</sup>Although closed to leasing and related oil and gas activity, any other surface disturbing or disrupting use would follow the surface disturbance prescriptions.

<sup>3</sup>Acres values do not include areas that have not been assessed.

Table 2-6 shows the number of acres of surface and subsurface acres (for coalbed natural gas exploration and development) that are subject to leasing restrictions. The acreage values provided in the table are organized by the type and level of restriction and mineral development potential.

**Table 2-6. Areas of Fluid Mineral Lease Conditional Requirements by Hydrocarbon Potential for Coalbed Natural Gas**

Fluid Mineral Lease Conditional Requirement	Hydrocarbon Development Potential						Total <sup>3</sup>
	None	Very Low	Low	Moderate	High		
<b>ALTERNATIVE A (NO ACTION ALTERNATIVE)</b>							
Available for Leasing, Subject to the Terms and Conditions of the Standard Lease Form	414,407	403,419	26,115	24,687	0	868,628	
Available for Leasing, Subject to Moderate Constraints <sup>1</sup>	1,235,763	608,134	88,707	45,498	0	1,978,101	
Available for Leasing, Subject to Major Constraints <sup>1</sup>	292,954	199,706	14,776	10,883	0	518,318	
Unavailable for Leasing <sup>2</sup>	115,773	217,800	2,366	0	0	335,939	
<b>ALTERNATIVE B</b>							
Available for Leasing, Subject to the Terms and Conditions of the Standard Lease Form	85,525	120,668	31,649	29,586	0	267,428	
Available for Leasing, Subject to Moderate Constraints <sup>1</sup>	62,225	59,957	4,273	976	0	127,431	

Fluid Mineral Lease Conditional Requirement	Hydrocarbon Development Potential					
	None	Very Low	Low	Moderate	High	Total <sup>3</sup>
Available for Leasing, Subject to Major Constraints <sup>1</sup>	387,162	361,158	37,039	30,247	0	<b>815,607</b>
Closed to Leasing <sup>2</sup>	1,523,984	887,275	59,002	20,259	0	<b>2,490,520</b>
<b>ALTERNATIVE C</b>						
Available for Leasing, Subject to the Terms and Conditions of the Standard Lease Form	634,101	77,499	77,499	54,627	0	<b>1,663,700</b>
Available for Leasing, Subject to Moderate Constraints <sup>1</sup>	1,358,838	493,460	51,729	25,016	0	<b>1,929,044</b>
Available for Leasing, Subject to Major Constraints <sup>1</sup>	65,956	38,047	2,735	1,425	0	<b>108,163</b>
Closed to Leasing <sup>2</sup>	0	79	0	0	0	<b>79</b>
<b>ALTERNATIVE D</b>						
Available for Leasing, Subject to the Terms and Conditions of the Standard Lease Form	361,600	365,547	47,658	42,942	0	<b>817,747</b>
Available for Leasing, Subject to Moderate Constraints <sup>1</sup>	1,402,876	897,149	81,574	36,701	0	<b>2,418,296</b>
Available for Leasing, Subject to Major Constraints <sup>1</sup>	153,802	36,692	2,735	1,425	0	<b>194,654</b>
Closed to Leasing <sup>2</sup>	140,618	129,670	0	0	0	<b>270,288</b>

<sup>1</sup>All activities would be subject to intensive mitigation, including offsite placement of facilities; remote control monitoring; restricted or prohibited surface use, including road construction; multiple wells from a single pad; central tank batteries and facilities; pipelines and power lines concentrated in specific areas; etc., based on site-specific analysis. Moderate constraints include CSU stipulations. Major constraints include NSO stipulations.

<sup>2</sup>Although closed to leasing and related oil and gas activity, any other surface disturbing or disrupting use would follow the surface disturbance prescriptions.

<sup>3</sup>Acreage values do not include areas that have not been assessed.

**Table 2-7. Areas Closed to Solid Leasable Minerals**

<b>Area</b>	<b>Alternative A (No Action Alternative)</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
<b>CLOSED TO COAL LEASING AND DEVELOPMENT</b>				
Areas outside the coal occurrence and development potential area but within the planning area		X		
Big game crucial winter ranges, parturition areas, migration corridors and transitional habitats		X		
Boars Tusk ACEC		X		
City of Rock Springs Expansion Area	X			X
Sweetwater County Growth Management Area		X		X
Greater Red Creek ACEC (Currant Creek Watershed)	X			
Greater Red Creek ACEC		X		
Greater Sand Dunes ACEC (western portion)	X	X		X
North Fork Vermillion Creek Drainage	X	X	X	X
Oregon Buttes ACEC	X			X
Raptor nest sites (in JMH area) with ¼-mile buffer	X			
Within one mile of raptor active and historic nest sites		X		
Monument Valley ACEC		X		
Crookston Ranch Site	X			X
South Pass Historic Landscape ACEC	X	X		X
Tri-Territory Marker	X	X	X	X
Within ¼ mile of 100-year floodplains, wetlands, riparian areas, perennial streams, and 500 feet of the edge of the inner gorge of large ephemeral drainages	X			X
Little Firehole's Cottonwood Canyon		X		X
Soils that have any of the following characteristics: <ul style="list-style-type: none"> <li>• Wind erodibility index greater than 100</li> <li>• Saline</li> <li>• Sodic</li> <li>• Saline-sodic</li> <li>• 2:1 clays</li> <li>• Sand dunes</li> <li>• Slopes greater than 25%</li> <li>• Slumps and creeps and/or rutting</li> <li>• Areas that are difficult to reclaim</li> </ul>		X		
Shallow unconfined aquifers		X		

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Prehistoric Quarry Sites (48SU1263 and 48SU7632)		X		
Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar, White Mountain Petroglyphs, and other significant rock art sites, three-mile viewshed		X		
Areas with high cultural site density such as Blue Point, Blue Forest, Adobe Town Rim, Cedar Canyon and the Bozovich site complex		X		
Known human burial sites		X		
Boyer Ranch House (formerly LaClede Stage Station) and Dug Springs Stage Station on the Overland Trail		X		
Within three miles of developed recreation sites		X		
Big Sandy Openings ACEC		X		
Little Mountain ACEC				X
Pine Springs ACEC		X		
Cedar Canyon ACEC		X		
South Wind River ACEC		X		
Lands with Wilderness Characteristics		X		
WSAs	X	X	X	X
Red Lake East Sand Dunes ACEC		X		
Big Game Migration Corridor ACEC		X		
Wind River Front SRMA				X
Wild and Scenic River segments (½-mile buffer)	X	X		X
Aquifer recharge area for town of Superior	X			
Aquifer recharge area for towns of Superior and McKinnon				X
<b>Total Acres</b>	<b>485,964</b>	<b>3,735,546</b>	<b>226,219</b>	<b>610,342</b>
<b>CLOSED TO OIL SHALE LEASING AND DEVELOPMENT</b>				
WSAs	X	X	X	X
Lands with Wilderness Characteristics		X		
Expansion Areas for Rock Springs and Green River Cities	X			X
Sweetwater County Growth Management Area		X		X
Within ¼ mile of historic trails	X	X		
JMH Area 3	X	X		
Mechanically Mineable Trona Area	X	X		X
Monument Valley Management Area	X	X		
Red Desert Management Area				X
National Historic Trails	X	X		X



Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Within ¼ mile of Wild and Scenic River segments	X	X		X
Within ¼ mile of 100-year floodplains, wetlands, riparian areas, perennial streams, and 500 feet of the edge of the inner gorge of large ephemeral drainages		X		
Soils that have any of the following characteristics: <ul style="list-style-type: none"> <li>• Wind erodibility index greater than 100</li> <li>• Saline</li> <li>• Sodic</li> <li>• Saline-sodic</li> <li>• 2:1 clays</li> <li>• Sand dunes</li> <li>• Slopes greater than 25%,</li> <li>• Slumps and creeps and/or rutting</li> <li>• Areas that are difficult to reclaim</li> </ul>		X		
Shallow unconfined aquifers		X		
Big game crucial winter ranges, parturition areas, migration corridors and transitional habitats		X		
Little Firehole's Cottonwood Canyon		X		X
Prehistoric Quarry Sites (48SU1263 and 48SU7632)		X		
Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar, White Mountain Petroglyphs, and other significant rock art sites, three-mile viewshed		X		
Tri-Territory Marker	X	X	X	X
Areas with high cultural site density such as Blue Point, Blue Forest, Adobe Town Rim, Cedar Canyon and the Bozovich site complex		X		
Known human burial sites		X		
Boyer Ranch House (formerly LaClede Stage Station) and Dug Springs Stage Station on the Overland Trail		X		
Crookston Ranch Site				X
Within three miles of developed recreation sites		X		
Big Sandy Openings ACEC		X		
Greater Red Creek ACEC		X		
Little Mountain ACEC				X
Oregon Buttes ACEC		X		
Pine Springs ACEC		X		
Cedar Canyon ACEC		X		
Steamboat ACEC				X

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
South Pass Historic Landscape ACEC		X		X
South Wind River ACEC		X		
Red Lake East Sand Dunes ACEC		X		
Big Game Migration Corridor ACEC		X		
Killpecker Sand Dunes SRMA				X
Aquifer recharge area for towns of Superior and McKinnon				X
<b>Total Acres</b>	<b>727,805</b>	<b>2,122,282</b>	<b>225,965</b>	<b>1,557,520</b>
<b>CLOSED TO TRONA LEASING AND DEVELOPMENT</b>				
Prospecting Permits within the Known Sodium Leasing Area	X			
Big game crucial winter ranges, parturition areas, migration corridors and transitional habitats		X		
Boars Tusk ACEC		X		
City of Rock Springs Expansion Area	X			
Sweetwater County Growth Management Area		X		X
Greater Red Creek ACEC (Currant Creek Watershed)	X			
Greater Red Creek ACEC		X		
Greater Sand Dunes ACEC (western portion)	X	X		
Important rock art sites, other important cultural resource values, and important geologic and ecologic features and ½-mile buffer		X		
Oregon Buttes ACEC	X	X		
Raptor nest sites (in JMH area)	X			
Within one mile of raptor active and historic nest sites		X		
Monument Valley ACEC		X		
Crookston Ranch Site	X			X
South Pass Historic Landscape ACEC	X	X		
Tri-Territory Marker	X	X	X	X
Within ¼ mile of 100-year floodplains, wetlands, riparian areas, perennial streams, and 500 feet of the edge of the inner gorge of large ephemeral drainages	X			
Little Firehole's Cottonwood Canyon		X		X

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Soils that have any of the following characteristics: <ul style="list-style-type: none"> <li>• Wind erodibility index greater than 100</li> <li>• Saline</li> <li>• Sodic</li> <li>• Saline-sodic</li> <li>• 2:1 clays</li> <li>• Sand dunes</li> <li>• Slopes greater than 25%</li> <li>• Slumps and creeps and/or rutting</li> <li>• Areas that are difficult to reclaim</li> </ul>		X		
Shallow unconfined aquifers		X		
Prehistoric Quarry Sites (48SU1263 and 48SU7632)		X		
Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar, White Mountain Petroglyphs, and other significant rock art sites, three-mile viewshed		X		
Within ¼ mile of significant rock art sites	X			
Areas with high cultural site density such as Blue Point, Blue Forest, Adobe Town Rim, Cedar Canyon and the Bozovich site complex		X		
Known human burial sites		X		
Boyer Ranch House (formerly LaCledde Stage Station) and Dug Springs Stage Station on the Overland Trail		X		
Within three miles of developed recreation sites		X		
Big Sandy Openings ACEC		X		
Pine Springs ACEC		X		
Cedar Canyon ACEC		X		
South Wind River ACEC		X		
Lands with Wilderness Characteristics		X		
WSAs	X	X	X	X
Red Lake East Sand Dunes ACEC		X		
Big Game Migration Corridor ACEC		X		
Wild and Scenic River segments (½-mile buffer)	X	X		
<b>Total Acres</b>	<b>423,633</b>	<b>2,119,920</b>	<b>225,965</b>	<b>389,552</b>

**Table 2-8. Areas Closed to Mineral Material Sales/Disposals**

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<b>CLOSED TO MINERAL MATERIAL SALES/DISPOSALS</b>				
14-Mile Recreation Area	X			
Areas with high cultural site density such as Blue Point, Blue Forest, Adobe Town Rim, Cedar Canyon and the Bozovich site complex	X	X		
Big game crucial winter range, parturition areas, and migration corridors (within ½ mile)		X		
Big Sandy Openings ACEC		X		
Big Sandy River and ½-mile buffer (1.5 miles)	X			
Boars Tusk + 1,400 acres of BLM-administered lands surrounding the area	X			
Boars Tusk ACEC		X		
Cedar Canyon Petroglyph rock art site and the surrounding viewshed (within three miles)	X	X		
Cottonwood Canyon	X	X		X
Crookston Ranch	X	X		X
Dry Sandy Swales	X	X	X	
Boyer Ranch House (formerly LaClede Stage Station) and Dug Springs Stage Station on the Overland Trail	X	X		
Emmons Cone	X	X	X	X
Four J Basin		X		
Greater Red Creek ACEC		X		
Greater Red Creek ACEC, Currant Creek Watershed	X			
Greater Red Creek ACEC, Red Creek Portion	X			
Greater Red Creek ACEC, Salt Wells Portion		X		
Greater Red Creek ACEC, Sugarloaf Basin Portion		X		
Greater Sand Dunes ACEC	X	X		
Human Burial Sites	X	X	X	X

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Other Historic Roads and Trails (Overland Trail, the Cherokee Trail, the Point of Rocks to South Pass Road and other Expansion Era roads and trails) within two miles of intact segments, and within two to five miles for highly visible projects		X		
Lands with Wilderness Characteristics: Dry Hollow Creek, Teepee Mountain, Potter Mountain, Laney Rim, Hay Ditch, North Pacific Creek, Mowing Machine Draw, Bush Creek, Bear Creek Trail		X		
Little Mountain ACEC				X
Monument Valley ACEC		X		
National Historic Trails (within five miles)		X		
Natural Corrals				X
Natural Corrals ACEC	X	X		
North and South Table Mountains	X			
Occupied Raptor Nests	X			
Oregon Buttes ACEC	X	X		
Parting-of-the-Ways Historical Site	X			
Pilot Butte	X	X	X	X
Pine Butte	X			
Pine Springs				X
Pine Springs ACEC	X	X		
Pinnacles ACEC		X		
Pinnacles Geologic Feature				X
Prehistoric Quarry Sites (48SU1263 and 48SU7632)	X	X		X
Developed recreation sites, three-mile buffer or visual horizon		X		
Developed recreation sites (within ¼ mile)	X			
Riparian: 100-year floodplains, wetlands, riparian areas or perennial streams, and within 500 feet of the edge of the inner gorge of large ephemeral drainages	X	X		
Sand Dunes ACEC	X			
Shallow, unconfined aquifers		X		

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar, White Mountain Petroglyphs, and other significant rock art sites				X
Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar, White Mountain Petroglyphs, and other significant rock art sites and ½-mile viewshed	X			
Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar, White Mountain Petroglyphs, and other significant rock art sites, three-mile viewshed		X		
Soils—highly erodible, saline, sodic, saline-sodic, 2:1 clays, and in sand dunes, slopes greater than 25%, soil slumps and creeps, soils sensitive to compaction and/or rutting, and areas that are difficult to reclaim		X		
South Pass Historic Landscape ACEC		X		
South Pass Historic Landscape ACEC (visible portion) – JMH	X			
South Pass Summit – JMH	X			
South Wind River ACEC		X		
Special Status Plant Species Communities, known locations	X	X		
Within 100 feet of known locations of special status plant species				X
Special Status Plant Species ACEC	X	X		X
Steamboat Mountain ACEC	X	X		
Tri-Territory Marker	X	X	X	X
White Mountain Petroglyphs ACEC	X	X		
Wild Horse Viewing Area	X	X		
Within ½ mile of Wild and Scenic Rivers	X	X		X
WSAs	X	X	X	X
Killpecker Sand Dunes SRMA				X
Oregon and Mormon Pioneer National Historic Trails SRMA			X	
Red Lake East Sand Dunes ACEC		X		

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Big Game Migration Corridor ACEC		X		
Little Firehole's Cottonwood Canyon		X		X
<b>Total Acres</b>	<b>833,719</b>	<b>2,581,741</b>	<b>226,421</b>	<b>362,009</b>

**Table 2-9. Visual Resource Management Classifications (acres)**

VRM Classification	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Class I	225,717	225,785	226,629	225,703
Class II	582,672	2,148,902	607,899	1,178,718
Class III	615,492	666,522	395,683	738,311
Class IV	2,180,423	563,754	2,374,706	1,455,234

**Table 2-10. Rights-of-Way Limitations**

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<b>EXCLUSION AREAS</b>				
Big Sandy river (½-mile wide corridor, 1.5-mile long)	X			
Big Sandy Openings ACEC		X		
Boars Tusk ACEC		X		
Boars Tusk (90 acres)				X
Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar, White Mountain Petroglyphs, and other significant rock art sites and ½-mile viewshed	X			
Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar, White Mountain, and other significant rock art sites				X
Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar, White Mountain Petroglyphs, and other significant rock art sites, three-mile viewshed		X		
Crookston Ranch ACEC		X		
Dry Sandy Swales	X	X	X	
Boyer Ranch House (formerly LaCiede Stage Station) and Dug Springs Stage Station on the Overland Trail	X	X		
Greater Red Creek ACEC		X		

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Grater Red Creek ACEC – Currant Creek Watershed Portion	X	X		
Grater Red Creek ACEC – Red Creek Portion		X		
Greater Red Creek ACEC – Red Creek Portion from the Red Creek escarpment south to Richards Gap (10-year timeframe)	X			
Greater Red Creek ACEC, Salt Wells Portion and Four J Basin (formerly Pine Mountain Management Area)		X		
Greater Red Creek ACEC, Sugarloaf Basin Portion (formerly Sugarloaf Basin Management Area)		X		
Greater Sand Dunes ACEC (eastern portion)		X		
Indian Gap – JMH	X			
Known human burial sites		X	X	X
Lands with Wilderness Characteristics: Dry Hollow Creek, Teepee Mountain, Potter Mountain, Laney Rim, Hay Ditch, North Pacific Creek, Mowing Machine Draw, Bush Creek, Bear Creek Trail		X		
Little Firehole's Cottonwood Canyon area		X		
Native American Burial Sites	X			
Natural Corrals				X
Natural Corrals ACEC	X	X		
Oregon Buttes ACEC – JMH	X			
Oregon Buttes ACEC		X		
Other Historic Roads and Trails (Overland Trail, the Cherokee Trail, the Point of Rocks to South Pass Road and other Expansion Era roads and trails) within two miles of intact segments		X		
Pine Butte	X			
Pinnacles Geologic Feature (JMH)	X			
Pinnacles ACEC		X		
Pinnacles Geologic Feature				X
Pine Springs ACEC		X		
Prehistoric Quarry Sites (48SU1263 and 48SU7632)	X	X		



Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Red Desert Watershed Management Area (windows eliminated, overhead powerlines prohibited)		X		
South Pass Historic Landscape ACEC (visible portion)	X			
South Pass Historic Landscape ACEC		X		X
South Wind River ACEC		X		
Special status plant species' known or potential habitat		X		
Special Status Plant ACEC	X	X		X
Steamboat Mountain ACEC		X		
Sweetwater River Wild, Scenic and Recreational Segments (½-mile corridor, 9.7 miles long)	X	X		X
Tri-Territory Marker	X	X	X	X
White Mountain Petroglyphs ACEC	X	X		
Wild and Scenic Rivers	X	X		X
WSAs	X	X	X	X
Crookston Ranch				X
Red Lake East Sand Dunes ACEC		X		
Big Game Migration Corridor ACEC		X		
<b>Total Acres</b>	<b>426,709</b>	<b>2,480,876</b>	<b>225,784</b>	<b>286,289</b>
<b>AVOIDANCE AREAS</b>				
14-Mile Recreation Area	X			
I-80 Point of Rock to Green River (for major utility lines)	X	X		X
Boars Tusk	X			
Cedar Canyon, LaBarge Bluffs, Sugarloaf, Tolar, White Mountain, and other significant rock art sites, setting only				X
Connectivity area – JMH	X			
Crookston Ranch	X			
Dry Sandy Swales (¼-mile buffer)	X			
Emmons Cone	X			
Expansion era roads + ¼-mile buffer – JMH	X			
Greater Red Creek ACEC (area outside of individual watersheds)	X			
Greater Sand Dunes ACEC (and lands within one mile or visual horizon)	X	X		

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Greater Sand Dunes ACEC (eastern portion)	X			
Historic trails (¼-mile buffer)	X			
Within ½ mile of Horse Herd Viewing Areas	X	X		X
Little Mountain ACEC				X
Monument Valley (erosive soil areas and slopes >25%)	X			
Monument Valley (erosive soil areas and slopes >20%)		X		
National historic trails + ¼-mile buffer – JMH	X			
National historic trails within five to 15 miles		X		
Other Historic Roads and Trails (Overland Trail, the Cherokee Trail, the Point of Rocks to South Pass Road and other Expansion Era roads and trails) within two to five miles of intact segments		X		
North and South Table Mountains	X			
Pilot Butte	X			
Pine Mountain Management Area	X			X
Pine Springs				X
Pine Springs ACEC	X			
South Pass Historic Landscape ACEC (non- visible portion)	X			
Special Status Plants (known sites)	X		X	
Wind River Front SRMA (Eastern Unit)				X
Within 100 feet of known locations of special status plant species				X
Within 500 feet of eligible Historic Roads and Trails				X
Within ¼ mile of the Overland and Cherokee Trails				X
Steamboat Mountain ACEC	X			X
Sugarloaf Basin	X			
Sugarloaf Basin Management Area	X			X
West Sand Dunes Archaeological District	X	X		
Red Desert Management Area				X

Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Within 100-year floodplains; ¼ mile of wetlands, riparian areas, and perennial streams; 500 feet of the outer edge of wetland/riparian areas or perennial streams; and 100 feet of the edge of the inner gorge of intermittent channels or ephemeral drainages.				X
Some basin big sagebrush/lemon scurfpea areas along the base of Steamboat Mountain				X
Farson Fossil Fish Beds				X
National Trail Management Corridor (5 miles)				X
Little Firehole's Cottonwood Canyon area				X
Killpecker Sand Dunes SRMA			X	X
Oregon and Mormon Pioneer National Historic Trails SRMA			X	
Aquifer recharge area for towns of Superior and McKinnon				X
<b>Total Acres</b>	<b>736,138</b>	<b>133,903</b>	<b>31,018</b>	<b>1,388,618</b>

Table 2-11. Off-Highway Vehicle Area Designations (acres)

OHV Designation	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Open	12,831	12,831	13,332	12,831
Closed	225,537	225,537	225,537	225,537
Limited to Designated Roads and Trails	968,959	3,367,576	3,365,374	3,367,576
Limited to Existing Roads and Trails	2,398,839	0	0	0

Table 2-12. Special Designations and Management Areas

Special Designation Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
<b>AREAS OF CRITICAL ENVIRONMENTAL CONCERN (ACEC) (ACRES)</b>				
Cedar Canyon ACEC	2,540	2,540	0	0
Greater Red Creek ACEC	131,600	468,170	0	0
Little Mountain ACEC	0	0	0	108,010

Special Designation Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Greater Sand Dunes ACEC	39,290	39,290	0	26,364
Natural Corrals ACEC	1,110	1,110	0	0
Oregon Buttes ACEC	3,440	3,440	0	3,440
Pine Springs ACEC	6,030	6,480	0	6,480
South Pass Historic Landscape ACEC	53,940	171,300	0	53,940
Special Status Plant Species ACEC	1,200	3,610	0	1,120
Steamboat Mountain ACEC	47,280	439,330	0	47,280
White Mountain Petroglyphs ACEC	20	20	0	0
South Wind River ACEC	0	374,710	0	0
Red Lake East Sand Dunes ACEC	0	22,340	0	0
Big Game Migration Corridor ACEC	0	226,335	0	0
Big Sandy Openings ACEC	0	2,020	0	0
Pinnacles ACEC	0	1,340	0	0
Monument Valley ACEC	0	69,960	0	0
<b>Total Acres</b>	<b>286,450</b>	<b>1,605,660</b>	<b>0</b>	<b>246,634</b>
<b>MANAGEMENT AREAS AND OTHER FEATURES (ACRES)</b>				
Red Desert Watershed Management Area	340,930	0	0	0
Red Desert Management Area	0	0	0	162,980
Red Desert Watershed Management Area	0	164,140	0	0
Pine Mountain Management Area	62,760	0	0	62,760
Sugarloaf Basin Management Area	87,240	0	0	87,240
Pinnacles Geographic Area	1,340	0	0	0
Monument Valley Management Area	69,960	0	0	0
West Sand Dunes Archaeological District	17,780	17,780	0	0
<b>Total Acres</b>	<b>580,010</b>	<b>183,938</b>	<b>0</b>	<b>312,980</b>
<b>SPECIAL RECREATION MANAGEMENT AREAS (SRMA) (ACRES)</b>				
Continental Divide National Scenic Trail SRMA	60	0	60	60

Special Designation Area	Alternative A (No Action Alternative)	Alternative B	Alternative C	Alternative D
Continental Divide Snowmobile Trail SRMA	90	0	90	0
Green River SRMA	700	0	700	0
Killpecker Sand Dunes SRMA	39,290	0	39,290	12,832
Oregon and Mormon Pioneer National Historic Trails SRMA	290	0	290	0
Little Mountain SRMA	0	0	40,550	40,550
Red Creek Badlands SRMA	0	0	261,140	0
Wind River Front SRMA	257,680	0	257,680	82,107
<b>Total Acres</b>	<b>298,110</b>	<b>0</b>	<b>599,800</b>	<b>135,549</b>
<b>WILD AND SCENIC RIVERS (MILES)</b>				
Sweetwater Wild and Scenic River	9.7	9.7	0	9.7
Wild Designation	5.8	5.8	0	5.8
Scenic Designation	0.5	0.5	0	0.5
Recreation Designation	3.4	3.4	0	3.4
<b>WILDERNESS STUDY AREAS (WSA) (ACRES)</b>				
Oregon Buttes WSA	5,860	5,860	5,860	5,860
Whitehorse Creek WSA	5,040	5,040	5,040	5,040
Honeycomb Buttes WSA	42,310	42,310	42,310	42,310
Alkali Draw WSA	17,910	17,910	17,910	17,910
South Pinnacles WSA	10,910	10,910	10,910	10,910
Red Lake WSA	9,550	9,550	9,550	9,550
East Sand Dunes WSA	12,800	12,800	12,800	12,800
Sand Dunes WSA	28,330	28,330	28,330	28,330
Buffalo Hump WSA	9,480	9,480	9,480	9,480
Adobe Town WSA	52,860	52,860	52,860	52,860
Red Creek Badlands WSA	8,690	8,690	8,690	8,690
Devil's Playground WSA	16,050	16,050	16,050	16,050
Twin Buttes WSA	8,170	8,170	8,170	8,170
<b>Total Acres</b>	<b>227,960</b>	<b>227,960</b>	<b>227,960</b>	<b>227,960</b>