APPENDIX 6—STANDARD PRACTICES, BEST MANAGEMENT PRACTICES, AND GUIDELINES FOR SURFACE DISTURBING ACTIVITIES

This appendix describes the practices utilized to mitigate adverse effects caused by surface disturbing activities.

Standard practices applied to surface disturbing activities are statements of guidelines and techniques for establishing statewide (or national) consistency in avoiding and mitigating environmental impacts and resource conflicts. These practices have been developed through field experience, planning analyses, and legal or regulatory directives. They emphasize the responsibility of the Bureau of Land Management (BLM) to ensure that good construction practices are used on public lands, and that they apply to all surface disturbing activities.

Best management practices (BMP) are developed by state agencies in cooperation with federal agencies to control nonpoint sources of pollution. Section 303(e) of the Clean Water Act and 40 CFR 130.5 require states to maintain a "Water Quality Management Continuing Planning Process." The process must establish procedures for adoption and appeals that, among other items, address BMPs. BMPs are advisory rather than regulatory. They are a key element in a State Nonpoint Source Management Plan, with which the Federal Government must comply under Executive Orders 12088 and 12372 and Clean Water Act Sections 319(k) and 301(k). The standard practices in this document are designed to meet the intent of the state's BMPs and may therefore be subject to revision when the state BMPs are finalized.

The State of Wyoming has released draft lists of BMPs that address silviculture and hydrology, and the state has issued a policy statement in lieu of BMPs for minerals and oil and gas. The state has not yet released a draft of BMPs for grazing. Wyoming has adopted the policy that the rules and regulations promulgated for oil and gas exploration, mineral extraction, and underground storage tanks shall be considered as the BMPs for these activities.

The Wyoming BLM policy on reclamation assumes that an area can and shall be ultimately reclaimed, and requires that every surface disturbance on public lands receive attention for short-term stabilization and long-term reclamation. Mitigation measures reduce to the extent possible the amount of reclamation that ultimately must take place. BLM must apply reasonable mitigation and provide guidance for all authorizations. The permit or authorization is the means provided for ensuring that mitigation measures are implemented. Compliance inspections during operations ensure that Conditions of Approval (COA) and/or stipulations are being followed. Compliance inspections on completion of work ensure that both surface and subsurface reclamation procedures have been properly followed.

Standard practices may develop through the National Environmental Policy Act (NEPA) process into stipulations prior to lease or grant issuance, or they may serve as a basis for COAs. If these practices (or newly developed techniques) are already incorporated into plans for development submitted by a permittee, such plans may be approved without the addition of any COAs. BLM would consider any project proposal; however, the burden is on the applicant to describe the design and construction techniques. If a project's design, scheduling, and construction techniques can mitigate environmental concerns, construction may be allowed without any COAs.

STANDARD PRACTICES

The following are standard practices applied to surface disturbing activities. These practices are applied, when necessary, to reduce environmental impacts. Large projects may require construction use plans

and/or erosion control, revegetation, and restoration plans (Appendix 5-3) that would incorporate these practices. The standard practices in this document are designed to meet the intent of the state's BMPs and may therefore be subject to revision when the state of the Green River Resource Management Plan (RMP) BMPs are finalized.

Although the paragraphs below address specific resources or types of development, the practices apply to all surface disturbing activities. These practices have been developed through experience working with surface disturbances in the Rock Springs Field Office. Therefore, these practices are believed to be the best practices available to address a variety of surface disturbance problems. These practices are not stipulations but represent concerns that must be addressed in any acceptable proposed surface disturbing activity. Operators are encouraged to review these practices, incorporate them where appropriate, and where possible develop better methods for achieving the same goals.

Air Quality

BLM actions must comply with all applicable air quality laws, regulations, and standards. As projects are proposed that include possible major sources of air pollutant emissions, air quality protection-related stipulations are added to BLM permits and right-of-way grants. In addition, BLM coordinates with the Wyoming Department of Environmental Quality, Air Quality Division (DEQ-AQD), during the process of analysis. This coordination results in technical review of applications for permits and/or identification of additional stipulations to be applied to these permits.

The release of hazardous air contaminants, particularly the emissions from sour natural gas sweetening plants (a process used to remove hydrogen sulfide [H_2S] from natural gas, resulting in the emission of sulfur dioxide), is a public concern. BLM requires industry to prepare analyses of risks involved in the development of sour gas pipelines and treatment facilities. These analyses are designed to project impacts both on the public and on resource values. To aid in achieving air quality goals, BLM would consult with the State of Wyoming, the U.S. Forest Service, industry, and the public to ensure that the most technically sound, environmentally balanced, and economically feasible decisions are made.

Additional Stipulations: The emission of fugitive dust shall be limited by all persons handling, transporting, or storing any material, to prevent unnecessary amounts of particulate matter from becoming airborne to the extent that ambient air standards described in these regulations are exceeded. Control measures, described as follows, or any equivalent method shall be considered appropriate for such control:

1. Where possible, use water or chemicals to control dust in the demolition of existing buildings or structures, and in construction operations, grading of roads, or clearing of land.
2. Apply asphalt, oil, water, or suitable chemicals to dirt roads, materials stockpiles, and other surfaces that can give rise to airborne dusts.
3. Install and use hood filters, fans, and fabric filters to enclose and vent the handling of dusty materials. Adequate containment methods shall be employed during sandblasting or other similar operations.
4. At all times when these trucks are in motion, cover open-bodied trucks used in transporting materials likely to give rise to airborne dust.
5. Conduct agricultural practices, such as tilling of land and application of fertilizers, in such a manner as to prevent dust from becoming airborne.
6. Pave and maintain roadways in a clean condition.

7. Promptly remove from paved streets earth or other material that has been transported by trucking or earthmoving equipment, by erosion by water, or by other means (Wyoming Air Quality Standards and Regulations, 1989, Section 14, Control of Particulate Emissions).

Based on improved modeling; reductions in nitrogen oxide (NO_x) emissions at the Naughton Power Plant near Kemmerer; and the timing, duration, and magnitude of visibility impacts from the projected wells and compression, the cumulative effects of NO_x emissions (as modeled for the Pinedale Anticline Project Environmental Impact Statement [EIS]) will remain within acceptable levels for visibility and lake acidity. Monitoring and emissions tracking for the protection of wilderness air quality-related values of visibility and lake acidification will continue, and reporting will be performed on an annual basis.

Wyoming DEQ-AQD emissions tracking will continue on an annual basis to report changes in permitted potential NO_x emission levels since January 1, 1996. In accordance with the Joint Agreement between BLM, Wyoming DEQ, U.S. Department of Agriculture (USDA) Forest Service, and the Environmental Protection Agency (EPA) for maintaining diligence in monitoring for the protection of wilderness air quality-related values of visibility and lake acidification, BLM, in consultation with the Wyoming DEQ-AQD, will track emissions for the Pinedale Anticline and the Jonah II projects on an annual basis. Any development within the Jack Morrow Hills Coordinated Activity Plan (JMH CAP) area also will be included in the tracking because of its proximity to the Bridger Wilderness area.

The construction and installation of compressors on BLM-administered lands will be coordinated with the Wyoming DEQ-AQD and all the operators. Before right-of-way grants or sundry notices will be issued for any compressor site on BLM-administered lands, additional site-specific environmental analysis will be required to address site-specific surface resource concerns and mitigation of unnecessary and undue impacts (e.g., cultural, wildlife, visual, noise impacts at dwellings, sage-grouse leks, etc.). Sites that are less than 4 miles from a dwelling will require additional hazardous air pollutant analysis.

Candidate Plants

Mitigation options to avoid or reduce impacts on rare plants may be limited because of specific habitat requirements or lack of necessary biological information to make such an assessment. Most of the common techniques, such as offsite compensation or habitat restoration, have proved largely unsuccessful, although seedbanking is commonly performed to attempt offsite propagation. Mitigation plans for areas where impacts on these species cannot be avoided are designed to provide special management actions that minimize the overall impact on the species. However, because of the difficulties of providing successful mitigation options, impacts on candidate plants are considered less than significant only if no net loss of population size or habitat quality results. "No net loss" is intended to mean that BLM must "ensure that [actions authorized, funded, or carried out by BLM]...affecting the habitat of candidate species are carried out in a manner that is consistent with the objectives for managing those species. BLM shall not carry out any actions that would cause any irreversible or irretrievable commitment of resources or reduce the future management options for the species involved" (BLM Manual 6840).

Fire

Guidelines for buffer areas (an area in which fire cannot spread) have been prepared to protect developed facilities and areas of highly erodible soils from the impacts of fire.

If the development is located in a grass community, a 15-foot buffer is recommended.

If the development is located in a sagebrush community, a 25-foot buffer is recommended.

In a juniper/tall brush community (serviceberry, aspen, cottonwood, willow), a 50-foot buffer is recommended.

In a conifer community (lodgepole, spruce fir), a buffer area of 25 feet plus the height of the surrounding trees is recommended.

The emissions that may be created directly by BLM activities are mitigated by applying BMPs. For example, prescribed fires are conducted to reduce emissions by burning only at appropriate fuel moistures and wind speeds (among other factors), which reduce as much as possible the smoke created. All BLM activities that may potentially cause undesirable air quality impacts are also coordinated with the Wyoming DEQ-AQD. Permits to conduct these activities are secured (where necessary) before the activity begins, to ensure compliance with all federal, state, and local air quality laws.

In support of prescribed fire activities, BLM may temporarily close areas to facilitate operations and to provide for public safety.

Pipelines and Communication Lines

On ditches exceeding 36 inches in width, 6 to 12 inches of surface soil should be salvaged where possible on the entire right-of-way. When pipelines and communication lines are buried, there should be at least 30 inches of backfill on top of the pipe. Backfill should not extend above the original ground level after the fill has settled. Guides for construction and water bar placement are found in "Surface Operating Standards for Oil and Gas Exploration and Development" (USDI 1978). Bladed surface materials would be respread on the cleared route once construction is completed. Disturbed areas that have been reclaimed may need to be fenced when the route is near livestock watering areas.

Existing crowned and ditched roads would be used for access where possible to minimize surface disturbances. Where possible, clearing of pipeline and communication line rights-of-way would be accomplished with the least degree of disturbance to topsoil. Where topsoil removal is necessary, it would be stockpiled (wind-rowed) and respread over the disturbance after construction and backfilling are completed. Vegetation removed from the right-of-way would also be required to be respread to provide protection, nutrient recycling, and a seed source.

To promote soil stability, the compaction of backfill over the trench would be required (not to extend above the original ground level after the fill has settled). Water bars, mulching, and terracing would be required as needed to minimize erosion. Instream protection structures (e.g., drop structures) may be required in drainages crossed by a pipeline to prevent erosion. The fencing of linear disturbances near livestock watering areas may be required.

Reclamation

Current BLM policy recognizes that there may be more than one correct way to achieve successful reclamation, and a variety of methods may be appropriate to the varying circumstances. BLM should continue to allow applicants to use their own expertise in recommending and implementing construction and reclamation projects. These allowances still hold the applicant responsible for final reclamation standards of performance.

BLM reclamation goals emphasize (1) protection of existing native vegetation, (2) minimal disturbance of existing environment, (3) soil stabilization through establishment of ground cover, and (4) establishment of native vegetation consistent with land use planning.

All reclamation is expected to be accomplished as soon as possible after the disturbance occurs, with efforts continuing until a satisfactory revegetation cover is established and the site is stabilized (3 to 5 years).

Only areas needed for construction would be allowed to be disturbed. Reclamation (by the lessee or grant holder) would be initiated as soon as possible after a disturbance occurs.

On all areas to be reclaimed, seed mixtures would be required to be site-specific, composed of native species, and would be required to include species promoting soil stability. A predisturbance species composition list must be developed for each site if the project encompasses an area where there are several different plant communities present. Livestock palatability and wildlife habitat needs would be given consideration in seed mix formulation. BLM guidance for native seed use is BLM Manual 1745 (Introduction, Transplant, Augmentation, and Reestablishment of Fish, Wildlife, and Plants), and Executive Order 13112 (Invasive Species).

Interseeding, secondary seeding, or staggered seeding may be required to accomplish revegetation objectives. During rehabilitation of areas in important wildlife habitat, provision would be made for the establishment of native browse and forb species, if determined to be beneficial for the habitat affected. Follow-up seeding or corrective erosion control measures may be required on areas of surface disturbance which experience reclamation failure.

Trees, shrubs, and ground cover (not to be cleared from rights-of-way) would require protection from construction damage. Backfilling to preconstruction condition (in a similar sequence and density) would be required. Restoration of normal surface drainage would also be required.

Any mulch used would be free from mold, fungi, or noxious weed seeds. Mulch may include native hay, small grain straw, wood fiber, live mulch, cotton, jute, synthetic netting, and rock. Straw mulch should contain fibers long enough to facilitate crimping and provide the greatest cover.

The grantee or lessee would be responsible for the control of all noxious weed infestations on surface disturbances. Aerial application of chemicals would be prohibited within one-quarter mile of special status plant locations, and hand application would be prohibited within 500 feet. Control measures would adhere to those allowed in the Rock Springs District Noxious Weed Control Environmental Assessment (EA) (USDI 1982a) or the Regional Northwest Area Noxious Weed Control Program EIS (USDI 1987). Herbicide application would be monitored by the BLM Authorized Officer.

Roads

Roads would be constructed as described in BLM Manual 9113. New main artery roads would be designed to reduce sediment, salt, and phosphate loading to the Green River. Where necessary, running surfaces of the roads would be graveled if the base does not already contain sufficient aggregate.

Existing roads would be upgraded where necessary.

Recognized roads, as shown on the Rock Springs District Office Transportation Plan, would be used when the alignment is acceptable for the proposed use. Generally roads would be required to follow

natural contours, to provide visual screening by constructing curves and by other means, and to be reclaimed to BLM standards.

To control or reduce sediment from roads, guidance involving proper road placement and buffer strips to stream channels; graveling; proper drainage; seasonal closure; and in some cases, redesign or closure of old roads, would be developed when necessary. Construction may also be prohibited during periods when soil material is saturated or frozen, or when watershed damage is likely to occur.

On newly constructed roads and permanent roads, the placement of topsoil, seeding, and stabilization would be required on all cut and fill slopes unless conditions (e.g., rock) prohibit it. No unnecessary sidecasting of material (e.g., maintenance) on steep slopes would be allowed. Snow removal plans may be required so that snow removal does not adversely affect reclamation efforts or resources adjacent to the road.

Reclamation of abandoned roads would include requirements for reshaping, recontouring, resurfacing with topsoil, installing water bars, and seeding on the contour. The removal of structures such as bridges, culverts, cattleguards, and signs usually would be required. Stripped vegetation would be spread over the disturbance for nutrient recycling where practical. Fertilization or fencing of these disturbances would not normally be required. Additional erosion control measures (e.g., fiber matting) and road barriers to discourage travel may be required.

Main artery roads, regardless of primary user, would be crowned, ditched, drained, and surfaced with gravel to reduce sediment, salt, and phosphate loading to the Green River.

Road closures may be implemented during crucial periods (e.g., wildlife winter periods, spring runoff, and calving and fawning seasons).

Soils

If clay soils are used as pit lining, they should have a liquid limit greater than 30 and a Plasticity Index of at least 20. Assuming that bentonite in drilling fluids would sufficiently seal a pit is not good procedure, because the bentonite would not be compacted, and uniform coverage and density would not be achieved. Bentonite is also subject to cracking if it is not designed properly.

Uncontrolled or designed settlement of clay particles does not provide a consistently adequate seal on a pit liner. Compaction or permeability testing should be used to determine pit characteristics.

Current objectives focus on soil conservation planning for surface disturbance actions. Soil conservation should be addressed during the initial phase of any surface disturbing action, thereby maintaining soil productivity and stability levels through the use of existing guidelines and techniques. Some areas may require more thorough soil management practices than others; however, this is dependent on the type and duration of the action and the effect on site-specific soil characteristics.

Some examples of standards applied throughout the field office area based on soil management criteria are as follows:

1. Closures due to saturated soil conditions when soil resource damage would occur due to wheel rutting or compaction on wet soils
2. Salvage and subsequent replacement of topsoil whenever possible on surface disturbing activities

3. Limiting disturbance on slopes of greater than 25 percent.

Emphasis should continue to be placed on the reduction of soil erosion and sediment into the Green River Basin watershed. Of particular importance would be those areas with saline soils, such as the Killpecker Creek drainage, or those areas with highly erodible geology and soils.

Management of the soil resource would continue to be based on the following factors: (1) evaluation and interpretation of soils in relation to project design and development, (2) identification and inventory of soils for baseline data, and (3) identification and implementation of methods to reduce accelerated erosion.

Evaluation and interpretation involves identification of soil properties that would influence their use, and recommendations for development while minimizing soil loss. Projects would be examined on a site-specific basis, evaluating the potential for soil loss and the compatibility of soil properties with project design. Stipulations and mitigating measures are provided on a case-by-case basis to ensure soil conservation and practical management. Projects requiring soil interpretations include construction of linear right-of-way facilities (i.e., pipelines, roads, railroads, and power transmission lines); construction of water impoundments; rangeland manipulation through fire or mechanical treatments; construction of plant site facilities, pump stations, well pads, and associated disturbances; and reclamation projects.

The current Order 3 soil survey is designed to update general soils information and provide data to those areas lacking soil inventories. A baseline soil inventory is ongoing to provide information on productivity, soil engineering properties, and soil erosion potentials. Proposed "I" category allotments and areas impacted by oil and gas projects receive priority in the soil survey process.

Identification of critical erosion condition areas would continue during soil surveys, monitoring, site-specific project analysis, and activity plan development for the purpose of avoidance and special management.

Before a surface disturbing activity is authorized, topsoil depth would be determined. The amount of topsoil to be removed, along with topsoil placement areas, would be specified in the authorization. The uniform distribution of topsoil over the area to be reclaimed would be required unless conditions warrant a varying depth. On large surface disturbing projects (e.g., gas processing plants), topsoil would be stockpiled and seeded to reduce erosion. Where feasible, topsoil stockpiles would be designed to maximize surface area to reduce impacts to soil microorganisms. Stockpiles remaining less than two years are best for soil microorganism survival and native seed viability. It is recommended that stockpiles be no more than 3 to 4 feet high. Areas used for spoil storage would be stripped of topsoil before spoil placement. The replacement of topsoil after spoil removal would be required.

Temporary disturbances that do not require major excavation (e.g., small pipelines and communication lines) may be stripped of vegetation to ground level using mechanical treatment, leaving topsoil intact and root mass relatively undisturbed.

In support of BLM's mission, soil management is committed to sustaining the productivity of soils.

Watershed

The entire land surface should be considered for nonpoint pollution control, with specific attention given to areas where the flow of water is concentrated (including roads, well pads, and stream channels).

Stream sediment, phosphate, and salinity load would be reduced where possible.

In areas where ground water exists 20 feet or less from the surface (Wyoming Oil & Gas Commission), produced water from oil and gas operations would be disposed of in an approved closed storage system or by other acceptable means complying with Onshore Order 7.

Where depth to ground water is less than 100 feet and soil permeability is more than 0.1 foot/day, plants, mills, or associated tailings ponds and sewage lagoons would not be allowed.

To protect watershed resources during wet periods, vehicle travel, particularly large or heavy truck traffic, would not be allowed unless travel occurs on roads that are graveled for all-season use.

Crossings of ephemeral, intermittent, and perennial streams associated with road and utility line construction would generally be restricted until after spring runoff and until normal flows are established.

Vegetative buffer strips of at least 100 feet should be left intact next to a perennial stream during controlled burning.

The inner gorge of intermittent and ephemeral drainages should be burned in such a manner as to leave unburned patches of vegetation. At no time should the burn consume more than 50 percent of the cover within the inner gorge area. The use of herbicides for vegetative manipulation should proceed with great care when in proximity to willows, cottonwoods, or aspens, so as not to damage such stands unless the prescription actually calls for such removal.

Herbicide loading sites will be located at least 500 feet from live water, floodplains, riparian areas, and all special status plant locations and will be utilized in accordance with the guidelines in Appendix 9-2 of the Green River RMP. Treatments will adhere to all label directions.

Floatable stream stretches should be managed so that there is no more than a 10 percent increase in fecal coliform count.

Vegetative buffer strips should be maintained between developed recreational facilities and live water.

Prior to installing toilet facilities associated with recreation, groundwater protection would be provided for.

Installation of instream structures for fisheries, watershed, or irrigation enhancement must be completely engineered if the high flow for the stream exceeds 10 cubic feet/second (CFS).

Floodplains by their very nature are unsafe locations for permanent structures. With an inundation of floodwaters, soils disturbed by construction could experience a rate of erosion greater than undisturbed sites. There is an additional concern over the potential for floodwaters to aid in the dispersal of hazardous materials that may be stored within permanent structures. Therefore, floodplains should have no permanent structures constructed within their boundaries unless it can be demonstrated on a case-by-case basis that there is no physically practical alternative. In cases where floodplain construction is approved, additional constraints could be applied.

Section 2.a(2) of Executive Order 11988 states in summary that, if the Head of the Agency finds that the only practicable alternative consistent with the law and with the policy set forth in the order requires siting in a floodplain, the agency shall, prior to taking action, (1) design or modify its action to minimize potential harm, and (2) prepare and circulate a notice containing an explanation of why the action proposed is to be located in the floodplain.

In addition, Section 3 of Executive Order 11988, in reference to federal real property and facilities, states that if facilities are to be located in a floodplain (i.e., when there is no practicable alterative), agencies shall ensure that flood protection measures are applied to new construction, or the agency can rehabilitate existing structures; elevate structures rather than fill the land; and provide flood height potential markings on facilities to be used by the public; and when the property is proposed for lease, easement, right-of-way, or disposal, the agency must attach restriction on uses in the conveyance or withhold from such conveyance.

Disturbances to the soils, such as roads and well pads, can easily concentrate the flow of water, increasing its erosive potential. A 500-foot buffer provides an opportunity for such flows to be dispersed before they reach a stream and often precludes construction in riparian zones. Therefore, there should be no construction within 500 feet of a stream unless it can be demonstrated on a case-by-case basis that there is no physically practical alternative. In cases where construction within the 500-foot zone is approved, additional constraints could be applied.

All surface disturbance, permanent facilities, and other such entities shall remain a minimum of 500 feet away from the edge of surface waters, riparian areas, wetlands, and 100-year floodplains unless it is determined through site-specific analysis, and the Field Manager approves in writing, that there is no practicable alternative to the proposed action. If such a circumstance exists, then all practicable measures to mitigate possible harm to the above areas must be employed. These mitigating measures would be determined case by case and may include (but are not limited to) diking, lining, screening, mulching, terracing, and diversions.

To minimize long-term surface disturbances within the vegetated sand dunes, options such as directional drilling, smaller well pads, and surface lines should be considered. To enhance reclamation success through surface stability, techniques to reduce wind erosion should be considered as standard procedures within this area. These methods could include snow fences, soil tackifiers, and erosion control matting.

Well Pads and Facilities

Surface discharge of produced water, including dumping of produced water on roads, will not be allowed unless levels of total dissolved solids (TDS) are less than 5,000 milligrams per liter (mg/1) (state standard for Colorado River drainage) and the water does not contain hazardous material. No produced water would be allowed on roads in Sublette County.

Both produced water and reserve pits should be constructed to ensure protection of surface water and groundwater. The review to determine the need for installation of lining material should be done on a case-by-case basis and consider soil permeability, water quality, and depth to groundwater. Oil-based muds used for drilling operations should be environmentally acceptable.

Pits would be fenced as specified in individual authorizations. Any pits with harmful fluids in them shall be maintained in a manner that would prevent migratory bird mortality (http://mountain-prairie.fws.gov/contaminants/contaminants1c.html).

Abandoned sites must be satisfactorily rehabilitated in accordance with a plan approved by BLM. Soil samples may be analyzed to determine reclamation potential, appropriate reseeding species, and nutrient deficits. Tests may include pH, mechanical analysis, electrical conductivity, and sodium content. Terraces or elongated water breaks would be constructed after slope reduction. Disturbances should be reclaimed or managed for zero runoff from the location until the area is stabilized. All excavations and pits should be closed by backfilling and contouring to conform to surrounding terrain. On well pads and

larger locations, the surface use plan would include objectives for successful reclamation, including soil stabilization, plant community composition, and desired vegetation density and diversity.

On producing locations, operators would be required to reduce slopes to original contours (not to exceed 3:1 slopes). Areas not used for production purposes should be backfilled and blended into the surrounding terrain and reseeded. Erosion control measures should be installed, as they would be required after slope reduction. Facilities would be required to approach zero runoff from the location to avoid contamination and water quality degradation downstream. Mulching, erosion control measures, and fertilization may be required to achieve acceptable stabilization.

Reserve pits would not be located in areas where ground water is less than 50 feet from the surface or soil permeability is greater than 10^{-7}cm/hr.

Produced water from oil and gas operations would be disposed of in accordance with the requirements of Onshore Oil and Gas Order 7, DEQ, and other agencies. Produced water would not be discharged in a way that would adversely affect land or channel integrity, stream health, achievement of standards for healthy rangelands, salinity levels, or proper functioning condition. Water injection and disposal facilities will meet all federal and state standards. The preferred method of produced water disposal is by aquifer reinjection. Water injection and evaporation facilities will meet all federal and state standards.

Any produced water pit or drilling fluids pit that shows indications of containing hazardous wastes would be tested for the Toxicity Characteristic Leaching Procedure constituents. If analysis proves positive, the fluids would be disposed of in an approved manner. The cost of the testing and disposal would be borne by the potentially responsible party.

No surface disturbance is recommended on slopes in excess of 25 percent unless erosion controls can be ensured and adequate revegetation is expected. Engineering proposals and revegetation and restoration plans would be required in these areas.

No sour gas lines would be located closer than 1 mile to a populated area or sensitive receptor. The applicants must use the best available engineering design (e.g., alignment, block valve type and spacing, pipe grade) and best construction techniques (e.g., surveillance, warning signs) as approved by the Authorized Officer to minimize both the probability of rupture and the radius of exposure in the event of an accidental pipeline release of sour gas. A variance from the 1-mile distance may be granted by the Authorized Officer based on detailed site-specific analysis that would consider meteorology, topography, and special pipeline design and/or construction measures. This analysis would ensure that populated areas and sensitive receptors would not be exposed to an increased level of risk.

Wilderness

A controlled surface use stipulation would be applied for activities within one-quarter mile or the visual horizon of the wilderness study area (WSA) boundary. Actions within or adjacent to the WSAs would be evaluated on a case-by-case basis to determine whether appropriate mitigation would be necessary.

Special Status Species

A lease stipulation is applied to all leases for protection of special status species and their habitats.

Mountain Plover (Wyoming BLM Sensitive)

Surveys will be conducted within suitable plover habitat by a qualified biologist using protocol determined by the Rock Springs BLM biologist. Surveys will be conducted to determine the presence or absence of breeding plovers (i.e., displaying males and foraging adults).

Surveys to determine the presence or absence of plovers should be conducted between May 1 and June 15 throughout the breeding range.

The survey type chosen for a project and the extent of the survey area (i.e., beyond the edge of the construction or operational right-of-way) will depend on the type of project activity being analyzed (e.g., construction, operation). Some techniques common to each survey method are as follows:

- Surveys are conducted during early courtship and territorial establishment. Throughout the breeding range, this period extends from approximately mid-April through early June. However, the specific breeding period depends on latitude, elevation, and weather.
- Surveys are conducted between local sunrise and 10 a.m. and from 5:30 p.m. to sunset (periods of horizontal light to facilitate spotting the white breast of the adult plovers).
- Transects are driven within the project area to minimize early flushing. Flushing distances for mountain plovers may be within 3 meters (9 to 10 feet) for vehicles, but plovers often flush at 50 to 100 meters (164 to 328 feet) when approached by humans on foot.
- For all breeding birds observed, additional surveys are conducted immediately prior to construction activities to search for active nest sites.
- If an active nest is located, an appropriate buffer area should be established to prevent direct loss of the nest or indirect impacts from human-related disturbance. The appropriate buffer distance will vary depending on topography, type of activity proposed, and duration of disturbance. For disturbances including pedestrian foot traffic and continual equipment operations, a one-quarter mile buffer is recommended.
- Where nesting plovers are found, activity within one-quarter mile would be restricted from April 10 to July 10. Surveys would be conducted prior to and as close to the actual date of construction initiation as possible, but no more than 14 days before the date actual ground disturbance activities begin. If more than one survey is required, the surveys would be made at least 14 days apart, with the last survey no more than 14 days before startup date.
- Where roads or well pads have been constructed prior to the mountain plover nesting season, and use of these areas has not been initiated for development action, BLM would require site investigations of these areas prior to use to determine whether mountain plovers are using these areas. In the event that mountain plover nesting is occurring, the BLM may require delays in planned activities until nesting is complete.

Greater Sage-Grouse (Wyoming BLM Sensitive)

Management Practices

These management practices have been developed using the information in the "Wyoming Greater Sage-Grouse Conservation Plan" (WGFD 2003), the "Guidelines to Manage Sage Grouse Populations and Their Habitats" (Connelly et al. 2000), and professional analysis of the effects of surface disturbing activities within the BLM Rock Springs Field Office.

* Denotes sections of the management recommendations derived from the "Wyoming Greater Sage-Grouse Conservation Plan" (WGFD 2003).

** Denotes sections derived from the "Guidelines to Manage Sage Grouse Populations and Their Habitats" (Connelly et al. 2000).

These management practices are intended to address only the concerns with greater sage-grouse. It is assumed that other species and resources will be analyzed with any management proposal and management of all resources affected will be considered consistent with the BLM multiple-use mandate.

All Habitats Used by Greater Sage-Grouse

Goal

1. * Maintain landscapes in a vegetative mosaic that provides a variety of early, mid, and late seral stages.

2. * Maintain and enhance healthy sagebrush ecosystems, which provide a diversity of sagebrush seral stages and types (age, structure, cover classes, density), plant and animal species diversity, and patches of appropriate habitat, including riparian areas (Wyoming BLM Standards for Healthy Rangelands [S&Gs]).

3. * Maintain a healthy sagebrush understory with a diversity and abundance of forbs and grasses (S&Gs).

4. * Maintain a healthy, diverse and abundant greater sage-grouse food source, including insects.

5. * Maintain seasonal habitats in amounts and proportions that provide for the needs of greater sage-grouse on a landscape scale.

6. * Maintain a variety of human uses, including traditional and emerging uses, while providing for the needs of greater sage-grouse (Green River RMP).

7. * Maintain soil stability, watershed function, integrity of nutrient cycles and energy flow Green River RMP.

General Guidelines

1. ** Monitor habitat conditions and propose treatments only if warranted by range condition (i.e., the area no longer supports habitat conditions described in the following guidelines).

2. ** Use appropriate vegetation treatment techniques (e.g., mechanical methods, fire) to remove junipers and other conifers that have invaded greater sage-grouse habitat (Commons et al. 1999). Whenever possible, employ vegetation control techniques that are least disruptive to the stand of sagebrush, if this stand meets the needs of greater sage-grouse.

3. ** Increase the visibility of fences and other structures occurring within one-half mile of seasonal ranges by flagging or similar means (fence tags) if these structures appear hazardous to flying grouse (e.g., birds have been observed hitting or narrowly missing these structures or grouse remains have been found next to these structures).

4. ** Avoid building power lines and other tall structures providing perch sites for raptors within 3 km (1.863 miles) of seasonal habitats. If these structures must be built, or presently exist, the lines should be buried or poles modified to prevent their use as raptor perch sites.

5. Surveys within greater sage-grouse habitat would be conducted by a qualified biologist during breeding and nesting periods. Surveys in nesting habitats would evaluate the habitat associated with active greater sage-grouse leks. Habitats would be delineated and mapped.

6. Include sage grouse habitat needs in desired plant community determinations. Manage upland vegetation for a variety of early, mid, and late seral stages at the landscape scale to provide greater sage-grouse with the variety of habitats required annually.

7. * Design and implement vegetation manipulations that benefit sagebrush ecosystems in the long term with consideration for the needs of greater sage-grouse. (see Vegetation Management Section) (Green River RMP and S&Gs).

8. * Manage for age class diversity and patchiness (within and between habitat types) in sagebrush habitats.

9. * Treat noxious weeds and other invasive plants of concern aggressively where they threaten quality of sagebrush habitat (Green River RMP).

10. * Provide information and educational materials about greater sage-grouse and their habitat needs (modified for clarity).

General Breeding Habitat Management (defined as leks, nesting, and early brood-rearing)

Leks and Associated Habitat Goal

1. * Maintain habitats associated with leks in a manner that provides adequate protein, calcium, and phosphorus rich foods, especially forbs to support nest initiation, clutch size, hatching success, and chick survival that will maintain robust populations and increase depressed populations.

2. * Maintain nesting habitat in a manner that provides adequate sagebrush, residual grass, and forb cover to maintain robust populations and increase depressed populations of greater sage-grouse.

3. * Maintain early brood-rearing habitat near nest sites in a manner that provides adequate areas with less sagebrush cover, higher herbaceous cover (especially forbs), and greater insect abundance and diversity as compared to nest sites.

Breeding Habitat Management Practices

1. ** Manage breeding habitats to support 15-25 percent canopy cover of sagebrush, perennial herbaceous cover averaging 4 to 6 inches in height with $\geq$15 percent canopy cover for grasses and $\geq$10 percent for forbs and a diversity of forbs (Barnett and Crawford 1994, Drut et al. 1994*a*, Apa 1998) during spring (Table 3-14, Chapter 3). Habitats meeting these conditions should have a high priority for wildfire suppression and should not be considered for sagebrush control programs. Sagebrush and herbaceous cover should provide overhead and lateral concealment from predators. If average sagebrush height is >30 inches, herbaceous cover may need to be substantially greater than 4 to 6 inches to provide this protection. Cover on leks does not have to meet the above requirements.

2. ** Use habitat mapping to identify nesting and early brood rearing habitats.

3. ** Although mining and energy development are common activities throughout the range of greater sage-grouse, quantitative data on the long-term effects of these activities on greater sage-grouse are limited. However, some negative impacts have been documented (Braun 1998). Thus, these activities should be discouraged in breeding and winter habitats, but when unavoidable, restoration efforts should follow procedures outlined in these guidelines. Wildfires should be suppressed in all breeding habitats. In the event of multiple fires, land management agencies should have all breeding habitats identified and prioritized for suppression, giving the highest priority to breeding habitats that have become fragmented or reduced by >40 percent in the past 30 years.

Breeding Habitat Restoration

1. ** Before initiating vegetation treatments, quantitatively evaluate the area proposed for treatment to ensure that it does not have sagebrush and herbaceous cover suitable for breeding habitat. Treatments should not be undertaken within greater sage-grouse habitats until the limiting vegetation factor(s) has been identified, the proposed treatment is known to provide the desired vegetation response, and land use activities can be managed after treatment to ensure that vegetation objectives are met.

2. ** Restore degraded rangelands to a condition that again provides suitable breeding habitat for greater sage-grouse by including sagebrush, native forbs (especially legumes), and native grasses in reseeding efforts (Apa 1998).

3. ** Where the sagebrush overstory is intact but the understory has been severely degraded and quality of nesting habitat has declined, use appropriate techniques (e.g., brush beating in strips or patches and interseed with native grasses and forbs) that retain some sagebrush, but open shrub canopy to encourage forb and grass growth.

4. ** Do not use fire in greater sage-grouse habitats prone to invasion by cheatgrass and other invasive weed species unless adequate measures are included in restoration plans to replace the cheatgrass understory with perennial species using approved reseeding strategies. These strategies could include, but are not limited to, use of pre-emergent herbicides (e.g., Oust™, Plateau™) to retard cheatgrass germination until perennial herbaceous species become established.

5. ** When restoring habitats dominated by Wyoming big sagebrush, regardless of the techniques used (e.g., prescribed fire, herbicides), do not treat >20 percent of the breeding habitat (including areas burned by wildfire) within a 30-year period (Bunting et al. 1987). The 30-year period represents the approximate recovery time for a stand of Wyoming big sagebrush. Additional treatments should be deferred until the previously treated area again provides suitable breeding habitat (Table 3-14). In some cases, this may take <30 years and in other cases >30 years. If 2,4-D or similar herbicides are used, they should be applied in strips in a manner that minimizes their effect on forbs. Because fire generally burns the best remaining greater sage-grouse habitats (i.e., those with the best understory) and leaves areas with sparse understory, use fire for habitat restoration only when it can be convincingly demonstrated to be in the best interest of greater sage-grouse.

6. ** When restoring habitats dominated by mountain big sagebrush, regardless of the techniques used (e.g., fire, herbicides), treat <20 percent of the breeding habitat (including areas burned by wildfire) within a 20-year period (Bunting et al. 1987). The 20-year period represents the approximate recovery time for a stand of mountain big sagebrush. Additional treatments should be deferred until the previously treated area again provides suitable breeding habitat. In some cases, this may take <20 years and in other cases >20 years. If 2,4-D or similar herbicides are used, they should be applied in strips in a manner that minimizes their effect on forbs.

7. ** All wildfires and prescribed burns should be evaluated as soon as possible to determine if reseeding is necessary to achieve habitat management objectives. If needed, reseed with sagebrush, native bunchgrasses, and forbs whenever possible.

8. ** Until research unequivocally demonstrates that use of tebuthiuron and similar acting herbicides to control sagebrush has no long-lasting negative impacts on greater sage-grouse habitat, use these herbicides only on an experimental basis and over a sufficiently small area that any long-term negative impacts are negligible. Because these herbicides have the potential of reducing but not eliminating sagebrush cover within grouse breeding habitats, thus stimulating herbaceous development, their use as greater sage-grouse habitat management tools should be closely examined.

9. ** For all greater sage-grouse populations, lek attendance, nesting, and early brood-rearing occur in breeding habitats. These habitats are sagebrush-dominated rangelands with a healthy herbaceous understory and are critical for survival of greater sage-grouse populations. Mechanical disturbance, prescribed fire, and herbicides can be used to restore greater sage-grouse habitats to those conditions identified as appropriate. Local biologists and range ecologists should select the appropriate technique on a case-by-case basis. Generally, fire should not be used in breeding habitats dominated by Wyoming big sagebrush (i.e., 15-25 percent live sagebrush canopy cover) if these areas support greater sage-grouse. Fire can be difficult to control and tends to burn the best remaining nesting and early brood rearing habitats (i.e., those areas with the best remaining understory) while leaving areas with poor understory.

Leks and Associated Habitat Management Practices

1. * Limit the distribution of specific lek site information given to the general public to avoid stressing birds. Avoid disturbance on lek sites while birds are on the lek, generally from March through May.

2. * Identify and map leks and lek-associated habitats.

3. * Maintain areas of low sagebrush canopy cover and high herbaceous composition adjacent to nesting habitat.

4. * Areas on or within one quarter mile of the perimeter of lek sites will be managed for controlled surface use.

Nesting Habitat Management Practices

1. * Any activity that removes sagebrush should leave adequate areas for nesting greater sage-grouse in occupied greater sage-grouse habitat. Areas with sagebrush canopy cover exceeding 30 percent should be evaluated for treatment (Green River RMP).

2. * Where understory is limiting, vegetation manipulations should be considered to restore the grass and forb component in sagebrush stands to meet the needs of nesting greater sage-grouse.

3. * Monitor nesting habitat to determine limitations on nesting suitability and success.

4. * Manage for forb abundance and diversity to benefit hen nutrition.

5. * Under sagebrush plants suitable for nesting, allow grass to achieve its annual growth potential. The percentage of nesting habitat existing in this condition should be determined on a site-specific basis.

6. * Manage interstitial areas between sagebrush in nesting habitat to enhance food forbs.

7. ** Monitor habitat conditions and propose treatments only if warranted by range condition (i.e., the area no longer supports habitat conditions described in the following guidelines under habitat protection). Do not base land treatments on schedules, targets, or quotas (Green River RMP and S&Gs).

Early Brood-Rearing Habitat Management Practices

1. * Manage sagebrush understory and interstitial areas in early brood-rearing habitats to provide an abundance of forbs, insects, and herbaceous cover.

Late Brood Rearing Habitat (Mid-July Through Mid-September)

As summer progresses and food plants mature and dry, greater sage-grouse move to areas still supporting succulent herbaceous vegetation. They continue to rely on adjacent sagebrush for protection from weather and predators, and for roosting and loafing. These areas may be lower elevation native or irrigated meadows where uplands lack green vegetation. Greater sage-grouse will also migrate to higher elevations, seeking habitats where succulent forbs are still available in sagebrush habitats or select sites, such as moist grassy areas or upland meadows. A delay in maturing of forbs has a noticeable effect on bird movements. In years with above-normal summer precipitation, greater sage-grouse may find succulent forbs on upland sites all summer. In more arid areas, riparian meadows become more important to survival of broods in the late summer. From mid to late summer, wet meadows, springs, and streams are the primary sites that produce the forbs and insects necessary for juvenile birds. The drier the summer, the more greater sage-grouse are attracted to the remaining green areas.

**A variety of habitats, including meadows, farmland, dry lake beds, sagebrush, and riparian zones, may be used by grouse from late June to early November (Patterson 1952, Wallestad 1975, Connelly 1982, Hanf et al. 1994). Generally, these habitats are characterized by relatively moist conditions and many succulent forbs in or adjacent to sagebrush cover.

Late Brood-Rearing Habitat Goal

1. * Maintain a mosaic of riparian habitats and wet meadows that provide an abundance of green forbs near sagebrush cover.

Late Brood-Rearing Habitat Management Practices

1. ** Avoid land use practices that reduce soil moisture effectiveness, increase erosion, cause invasion of exotic plants, and reduce abundance and diversity of forbs (Green River RMP and S&Gs).

2. ** Avoid removing sagebrush within 1,000 feet of greater sage-grouse foraging areas along riparian zones, meadows, lakebeds, and farmland, unless such removal is necessary to achieve habitat management objectives (e.g., meadow restoration).

3. ** Discourage use of highly toxic organophosphorus and carbamate in greater sage-grouse brood-rearing habitats. Less toxic agri-chemicals or biological control may provide suitable alternatives in these areas (BLM policy).

4. ** Avoid developing springs for livestock water in greater sage-grouse habitat, but if water from a spring will be used in a pipeline or trough, design the project to maintain free water and wet meadows at the spring. Capturing water from springs using pipelines and troughs may adversely affect wet meadows used by greater sage-grouse for foraging.

5. * Manage riparian habitats, wetlands, springs, and water sources in close proximity to sagebrush for food forbs and insects while maintaining the integrity of the riparian system (S&Gs and Green River RMP).

6. * Maintain sagebrush cover close to riparian areas or hay meadows.

7. * Consider creating water overflow on developed water sources, and fencing spring sources and overflow areas to provide food forbs.

Habitat Restoration

1. ** Use brush beating or other appropriate treatments in strips 13 feet–26 feet in areas with relatively high shrub canopy cover (>35 percent total shrub cover) to improve late brood-rearing habitats. Brush beating can be used to effectively create different age classes of sagebrush in large areas with little age diversity.

2. ** If brush beating is impractical, use fire or herbicides to create a mosaic of openings in mountain big sagebrush and mixed shrub communities used as late brood-rearing habitats where total shrub cover is >35 percent. Generally, 10–20 percent canopy cover of sagebrush and <25 percent total shrub cover will provide adequate habitat for greater sage-grouse during summer.

3. ** Only construct water developments for greater sage-grouse in, or adjacent to, known summer use areas and provide escape ramps suitable for all avian species and other small animals. Water developments and "guzzlers" may improve greater sage-grouse summer habitats (Autenrieth et al. 1982, Hanf et al. 1994).

4. ** Whenever possible, modify developed springs and other water sources to restore natural free-flowing water and wet meadow habitats.

Fall Habitat (Mid-September to First Major Snow)

* Time spent in fall habitat is highly dependent on weather conditions. Greater sage-grouse normally move off late brood-rearing habitat onto transitional fall habitat before moving onto winter range. As fall precipitation increases and temperatures decrease, greater sage-grouse move into mixed sagebrush-grassland habitats in moist upland and mid-slope draws where fall green-up of cool-season grasses and some forbs occur. As the meadows dry and frost kills forbs, sagebrush consumption increases. Fall movements to winter ranges are slow and meandering from late August to December. With major snowfall accumulation, greater sage-grouse move onto winter range.

Fall Habitat Goal

1. * Maintain linkages of sagebrush habitats that allow birds to move between late brood-rearing and winter habitats.

Fall Habitat Management Practices

1. * Avoid loss of fall habitat.

Winter Habitat (Mid-November through Mid-March)

Winter Habitat Goal

1. * Maintain winter habitats in a manner that results in sustained or improved health with no long-term net loss of severe winter habitat.

Winter Habitat Management Practices

1. ** Sagebrush is the essential component of winter habitat. Greater sage-grouse select winter use sites based on snow depth and topography, and snowfall can affect the amount and height of sagebrush available to greater sage-grouse (Connelly 1982, Hupp and Braun 1989, Robertson 1991). Thus, on a landscape scale, greater sage-grouse winter habitats should allow grouse access to sagebrush under all snow conditions.

2. ** Maintain sagebrush communities on a landscape scale, allowing greater sage-grouse access to sagebrush stands with canopy cover of 10–30 percent and heights of at least 10–14 inches regardless of snow cover. These areas should be high priority for wildfire suppression, and sagebrush control should be avoided.

3. ** Protect patches of sagebrush within burned areas from disturbance and manipulation. These areas may provide the only winter habitat for greater sage-grouse, and their loss could result in the extirpation of the grouse population. They are also important seed sources for sagebrush reestablishment in the burned areas. During fire suppression activities, do not remove or burn any remaining patches of sagebrush within the fire perimeter.

4. ** In areas of large-scale habitat loss ($\geq$40 percent of original winter habitat), protect all remaining habitats.

5. * Use aerial photos, surveys, other remote sensing techniques; local knowledge; and anecdotal information to identify winter habitat.

6. * Map winter habitat by vegetation type, range site, and seral stages.

7. * In greater sage-grouse winter habitat, manage for robust annual growth of leaves and leaders on sagebrush.

8. * When planning sagebrush altering activities, consider winter habitat needs on a landscape scale.

9. * Integrate knowledge of wintering habitat with planning and management activities that will affect sagebrush habitats.

Habitat Restoration

1. ** Reseed former winter range with the appropriate subspecies of sagebrush and herbaceous species, unless the species are recolonizing the area in a density that would allow recovery within 15 years.

2. ** Discourage prescribed burns of >124-acre blocks and do not burn >20 percent of an area used by greater sage-grouse during winter within any 20- to 30-year interval (depending on estimated recovery time for the sagebrush habitat).

Greater Sage-Grouse Guidelines by Resource Program (WGFD 2003)

Livestock Grazing Goal

1. * Manage livestock grazing practices on federal lands in a manner that assists in maintaining healthy greater sage-grouse habitats or improving degraded habitats.

Livestock Grazing Management Practices

1. * Evaluate effects of different grazing treatments on greater sage-grouse productivity, survival, and habitat use.

2. * Actively educate permittees about grazing strategies that can be used to improve or maintain greater sage-grouse habitats. Where appropriate, implement livestock grazing systems that provide for areas and times of rest or deferment.

3. * Avoid heavy utilization of grazed pastures to compensate for rested pastures (a year of rest cannot compensate for a year of excessive use).

4. * Design grazing systems that provide greater sage-grouse habitat in riparian areas and around water sources.

5. * During periods of drought, utilize grazing schemes that reduce impacts on greater sage-grouse (e.g., adjust intensity, timing, and/or duration of grazing).

6. * Investigate the possibility of developing forage banks for use during periods of drought to alleviate inappropriate use by grazing animals on greater sage-grouse habitat.

7. * During the strutting period, reduce disturbance to greater sage-grouse from livestock management activities (e.g., salting or mineral placement, turnout or gathering, bed ground/camp locations, etc.).

8. * Develop and implement management plans for grazing that take into consideration the seasonal greater sage-grouse habitat needs. These management plans could include a variety of grazing systems designed to reach habitat goals, including short-duration, rest rotation, etc.

9. * Look for ways to minimize negative impacts and enhance greater sage-grouse habitat when establishing livestock range improvement projects (e.g., maintain free water available to greater sage-grouse when developing water for livestock, placement of fences, facilities that provide raptor perch sites, construction of roads, salt grounds) (modified for clarity).

10. * Avoid disruptive activities near leks during the breeding season between the hours of 8 p.m. and 8 a.m.

11. * Experiment with types of grazing to improve greater sage-grouse habitat accompanied by monitoring to determine effects on greater sage-grouse.

12. * Where necessary to build or maintain fences, evaluate whether increased visibility, alternate location, or different fence design will reduce hazards to flying grouse. Educate users of the federal lands on small changes can have very positive effects on greater sage-grouse and other species (JMH).

Surface Disturbing and Mineral Development Activities Goal

1. * Develop the resources in a manner compatible with maintenance and enhancement of greater sage-grouse populations and habitat (this sentence has been modified for clarity).

General Surface Disturbing Activities (Mineral Exploration and Development, Mining, Rights-of-Way, etc.) Management Practices (the following practices have been expanded from the Wyoming Greater Sage-Grouse Conservation Plan Minerals Section to include all surface disturbing and disruptive activities)

1. * Evaluate and address the needs of greater sage-grouse when placing well sites, mines, pits, and infrastructure (applies to all surface disturbing activities). Develop a plan for roads, pipelines, etc., to minimize impacts on greater sage-grouse.

2. * Develop a travel management plan that would consider seasonal closure of roads for all but permitted uses (i.e., well maintenance and livestock care) and encourage the reclamation of unnecessary or redundant roads (Green River RMP) (modified for clarity).

3. * Where mineral development occurs in greater sage-grouse habitat, tailor reclamation to restore, replace, or augment needed habitat types (Green River RMP).

4. * Where necessary to build or maintain fences, evaluate whether increased visibility, alternate location, or different fence design will reduce hazards to flying grouse (Green River RMP).

5. ** Avoid construction of overhead lines and other perch sites in greater sage-grouse habitat. Where these structures must be built, bury the lines, locate along existing utility corridors, or modify the structures to prevent perching of raptors and ravens (BLM 6840 policy and ESA).

6. * Reduce noise from industrial development or traffic, especially in breeding and brood-rearing habitats.

7. Do not allow surface discharge of produced water if it will negatively impact greater sage-grouse (BLM 6840 policy and ESA).

8. * Avoid surface and subsurface water depletion that impacts greater sage-grouse habitat.

9. * Consider an exception or waiver of seasonal stipulations if technologies that significantly reduce surface disturbance are used.

10. * Control dust from roads and other surface disturbances within the population's seasonal habitats.

11. * Consider offsite mitigation as an alternative mitigation for mineral development impacts on known greater sage-grouse habitat. Work with mineral entities to develop and implement acceptable offsite mitigative measures for enhancing greater sage-grouse or habitat, as needed, to offset impacts of surface disturbing activities.

12. ** Adjust timing of surface disturbing and disruptive activities (e.g., energy exploration, development, and construction activity) to minimize disturbance of greater sage-grouse breeding activities (this sentence has been modified for clarity) (Green River RMP).

13. ** Human activities within view of or one-quarter mile from leks should be minimized during the early morning and late evening (8 p.m. – 8 a.m.) when birds are near or on leks.

Oil and Gas Development and Sand and Gravel Mining (also see General Surface Disturbing Activities Management Practices)

1. * As a general rule, do not drill or permit new, or expand existing, sand and gravel activities or other surface disturbing activities in nesting habitat between March 15 and July 15 (dates from JMH).

2. Areas on or within one-quarter mile of known active lek sites will be managed as controlled surface use (Green River RMP).

3. * Where greater sage-grouse are present, avoid human activity adjacent to leks during the breeding season between the hours of 8 p.m. and 8 a.m.

4. * Where technically and economically feasible, use directional drilling or multiple wells from the same pad.

5. * Where facilities are developed within greater sage-grouse habitat, minimize potential use by predators.

6. * Encourage the development of new technologies that would reduce total surface disturbance within occupied greater sage-grouse habitat.

Other Solid Mineral Mining Operations (also see General Surface Disturbing Activities Management Practices)

1. * When feasible, new or expanded exploration and/or mining activities in nesting habitats should occur prior to March 15 or after July 15. Following initiation of mining (i.e., topsoil stripping), this recommendation would not be applied.

2. Controlled surface use is applied on or within one-quarter mile of the perimeter of known active lek sites from March 1 to July 15 (Green River RMP).

3. Where greater sage-grouse are present, avoid disturbance by human activity adjacent to leks during the breeding season between the hours of 8 p.m. and 8 a.m. This management practice may not be practical in active coal mining areas.

Pesticide Use Goals in Greater Sage-Grouse Habitat

1. * Conduct pesticide application efforts in a manner that is compatible with greater sage-grouse health and habitat needs.

2. * Encourage development of a statewide pesticide use database.

Pesticide Management Practices

1. * Coordinate with the county Weed and Pest Districts to determine the extent of pesticide use within greater sage-grouse habitats (Green River RMP).

2. * Use the best available science to determine what, if any, effects each pesticide use may have on greater sage-grouse populations.

3. * Cooperate with the Wyoming Game and Fish Department by reporting where pesticides have caused mortality in greater sage-grouse.

4. * Work with county Weed and Pest Districts to identify low-toxicity alternatives to pesticides classified as a medium to very high risk to game birds.

Predator Management Goals in Greater Sage-Grouse Habitat

1. * Maintain habitat quality that discourages predation.

2. * Minimize the negative effects of predation to increase greater sage-grouse recruitment.

Predation Management Practices

1. * Consider predator control to maintain or enhance local greater sage-grouse populations when it is determined there is a demonstrated need, such as when a population is trending downward over a 3-year period, and when populations of "newcomer" predators are artificially high in greater sage-grouse habitat.

2. * Develop and distribute educational materials regarding human practices that may allow establishment/expansion of predator populations. Examples of these activities include garbage/waste disposal that may provide artificial food sources for a variety of predators, and buildings/structures that provide nesting/roosting habitat for ravens/raptors.

3. * Avoid construction of overhead lines and other perch sites in greater sage-grouse habitat. Where these structures must be built, bury the lines, locate along existing utility corridors, or modify the structures in key areas.

4. * Predator control to enhance greater sage-grouse survival should be targeted only at predators identified as impacting that greater sage-grouse population (JMH).

5. * Discourage the establishment of "newcomer" predators in greater sage-grouse habitat.

6. Monitor the effectiveness of any predator control efforts that are implemented (JMH).

Goals Related to Recreation in Greater Sage-Grouse Habitat

1. * Conduct recreational activities in a manner that is not disruptive to greater sage-grouse or their habitat.

Recreation Management Practices

1. * Develop travel management plans and enforce existing plans (JMH).

2. * Restrict off-highway vehicle use in occupied greater sage-grouse habitats (JMH).

3. * Avoid recreational activities in greater sage-grouse nesting habitat during the nesting season (this applies only to activities requiring a "Use Permit").

4. * Restrict organized recreational activities between March 15 and July 15 in nesting habitat (modified for clarity).

5. Recreational facilities should not be located in critical greater sage-grouse habitat.

6. * Viewing greater sage-grouse on leks (and censusing leks) should be conducted so that disturbance to birds is minimized or preferably eliminated.

7. * Do not provide all lek locations to individuals simply interested in viewing birds.

8. * Do not encourage additional dispersed camping within important riparian habitats occupied by greater sage-grouse during late summer (i.e., do not create improvements that would encourage more camping in those areas or issue special use permits in those areas) (modified for clarity).

9. * Avoid construction of overhead lines and other perch sites in occupied greater sage-grouse habitat. Where these structures must be built, bury the lines, locate along existing utility corridors, or modify the structures in key areas.

10. * Control dust from roads and other surface disturbances (Green River RMP).

Vegetation Management Goals

1. * Restore, maintain, and/or enhance sagebrush ecosystem health and ecological processes and functions, including associated riparian systems (S&Gs).

2. * Maintain or enhance natural vegetation patterns (e.g., to facilitate seasonal greater sage-grouse migrations), vegetation functions (e.g., cover/food), and natural processes (e.g., fire) (modified for clarity).

3. * Maintain sagebrush habitats with a healthy understory of native grasses and forbs, diversity of species, diversity of age classes, and patches of varying size and density (S&Gs).

Vegetation Management Practices

1. * Develop priorities and implement habitat enhancements in areas currently occupied by greater sage-grouse.

2. * Develop priorities and implement habitat enhancements in historical or potential greater sage-grouse habitats.

3. * Develop and implement wildfire suppression guidelines that address greater sage-grouse habitat health and management.

4. * Remove juniper and other conifers where they have invaded sagebrush sites important to greater sage-grouse (Green River RMP).

5. * Ensure that vegetation treatments and post-treatment management actions are appropriate to the soil, climate, and landform of the area (Green River RMP).

6. * Recognize that fire provides a natural diversity component in sagebrush habitats; manage fire on a landscape and patch scale at a local level.

7. * Prescribed fire in drier sagebrush communities should be conducted only where it is likely to promote sagebrush ecosystem health.

8. * In higher elevation, wetter sagebrush communities, prescribed fire should maintain, enhance, or promote sagebrush ecosystem health by mimicking natural fire frequencies (Green River RMP).

9. * Where greater sage-grouse are present or desired, fire management objectives should recognize that fire generally burns the better greater sage-grouse nesting and severe winter habitat.

10. * Evaluate all wildfires greater than 40 acres in occupied greater sage-grouse habitat to determine whether rehabilitation of the burned area is needed, with emphasis placed on habitats that would be susceptible to invasion by exotic annual grasses.

11. * When rehabilitation is necessary, the first priority is protection of the soil resource. Use appropriate mixtures of sagebrush, native grasses, and forbs that permit burned areas to recover to a sagebrush-perennial grass habitat (Green River RMP).

12. * Grazing management following sagebrush treatments or manipulations should be designed to benefit long-term sagebrush diversity and ecosystem health. Grazing management strategies should be designed to permit reestablishment of native sagebrush, grasses, and forbs that benefit greater sage-grouse (Green River RMP).

13. * Experiments in habitat manipulation should be relatively small in comparison to a specific greater sage-grouse population.

14. * Determine threshold levels of habitat alteration that can occur without negatively impacting specific greater sage-grouse populations. As a general rule, treat no more than 20 percent of any seasonal habitat type until results are evaluated.

15. * Treat sagebrush in patches rather than contiguous blocks.

16. * Protect patches of sagebrush within burned areas from disturbance and manipulation.

17. * Consider all alternatives when designing sagebrush treatments (Green River RMP).

18. * Additional treatments in adjacent areas should be deferred until the previously treated area again provides suitable greater sage-grouse habitat.

19. * Avoid removing sagebrush adjacent to greater sage-grouse foraging areas along riparian zones, meadows, lakebeds, and farmland (adjacent to federal land) unless such removal is necessary to achieve habitat management goals.

20. * Use mechanical or other appropriate treatments such as herbicides in areas with relatively high shrub cover (>30 percent) and a poor herbaceous component in order to improve brood-rearing habitats.

21. * Implement effective monitoring plans to determine the effectiveness of vegetation treatments.

22. * Develop and maintain cumulative records for all vegetation treatments to determine and evaluate site-specific and cumulative impacts on greater sage-grouse habitats and identify best management practices for successful vegetation treatments.

Weather-Related Goals

1. ** During drought periods (>2 consecutive years), reduce stocking rates or change management practices for livestock, wild horses, and wild ungulates if cover requirements during the nesting and brood rearing periods are not met. Grazing pressure from domestic livestock and wild ungulates should be managed in a manner that, at all times, addresses the possibility of drought.

2. Appropriate actions for improving drought-stressed rangelands could include, but would not be limited to, changes of permitted animal unit months (AUM), modified turnout dates, livestock water developments, range improvements, changes in grazing periods, and growing season rest (JMH).

3. * Better define weather- and climate-related effects on greater sage-grouse populations and their interactions with other limiting factors to correctly understand and assess fluctuations in greater sage-grouse populations. (This will be conducted as part of the implementation, evaluation, and monitoring management strategy [Appendix 17]).

4. * Determine cause and effect relationships between forage, drought, multiple uses, and greater sage-grouse recruitment.

Weather Management Practices

1. * Correlate, on a local level, historical and present weather data with historical and present greater sage-grouse population data to determine weather impacts on greater sage-grouse populations and habitat.

2. * Where drought has been documented for 2 consecutive years, consider implementation of management practices in year 3 that might include drought management of livestock and wildlife grazing, protection of critical greater sage-grouse habitats from wildfire and prescribed fire, predator management programs to enhance nesting and early brood rearing success of impacted populations, water hauling and protection of water sources from evaporation, installation of guzzlers, snow fences and fencing of water source overflows, ensuring that bird ladders are in place on existing water sources, and other appropriate management options developed by local greater sage-grouse working groups.

Habitat Assessment, Monitoring, and Evaluation Goals

Broad-Scale

1. * Monitor and evaluate the distribution of sagebrush systems that can or could support desired greater sage-grouse population objectives.

2. * Monitor and evaluate the health, integrity, and quality of sagebrush systems.

Mid-Scale

1. * Assess, monitor, and evaluate shrub cover characteristics capable of supporting greater sage-grouse seasonal habitat requirements developed from Wyoming data and other applicable data sources. Information and data should include patch sizes, successional stages, shrub age structure, height, density, and distribution throughout the range of sagebrush ecosystems. Particular attention should be given to identifying blocks, islands, corridors, and mosaic patterns and how they are arranged. It is important to maintain connectivity between habitat types.

2. * Develop and continue to refine ecological site descriptions and state-and-transition model assessments based on rangeland health procedures. Incorporate greater sage-grouse habitat preference characteristics related to sagebrush cover, height, growth form, age class and sagebrush species to evaluate the relationship of these characteristics to herbaceous understory requirements for greater sage-grouse seasonal habitats.

3. * Monitor and evaluate herbaceous understory characteristics with an emphasis on diversity of native forbs and grasses based on ecological site potential and successional status.

4. * Restore and rehabilitate sagebrush communities where feasible, desirable, or possible to maintain or enhance desired greater sage-grouse populations.

Fine-Scale

1. * Assess, monitor, and evaluate the distribution and condition of sagebrush and herbaceous cover within desired condition for greater sage-grouse seasonal range.

2. * Assess, monitor, and evaluate the diversity and condition of the understory with emphasis on native species within desired condition for greater sage-grouse seasonal range.

3. * Assess, monitor, and evaluate vegetation characteristics (i.e., shrub height, density, herbaceous structure, and composition diversity) across the range of conditions desired for greater sage-grouse seasonal range.

4. * Assess, monitor, and evaluate restoration and rehabilitation possibilities in sagebrush communities with the potential to provide greater sage-grouse seasonal habitat.

5. * Evaluate goals and objectives for sagebrush systems at the fine scale based on—

- Local knowledge about current habitat use
- Potential to support a variety of species including greater sage-grouse (S&G)
- Existing native shrub patterns and sagebrush system-associated characteristics
- Existing herbaceous cover and conditions
- Frequency and reasonably foreseeable likelihood of disturbance, e.g., fire
- Locations of seedlings or condition of shrub cover on adjacent areas
- Importance of the area to seasonal needs of greater sage-grouse.

Mapping

1. * Develop maps of current greater sage-grouse population seasonal use areas.

2. * Develop maps of greater sage-grouse habitats. Include documented positive or negative influences on greater sage-grouse or their habitat (e.g., land treatments, wildfire, utility corridors, etc.).

3. * Map vegetative type and seral stages in greater sage-grouse habitats. Evaluate quality of sagebrush habitats in the Jack Morrow Hills Planning Area.

4. * Identify and map canopy cover of sagebrush and herbaceous understory of sagebrush habitats. Evaluate habitat quality of herbaceous understory of greater sage-grouse habitats in the Jack Morrow Hills Planning Area.

5. * Periodically review and update maps to portray updated information on greater sage-grouse and their habitat.