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# Appendix C

## Required Design Features



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## REQUIRED DESIGN FEATURES

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Required Design Features (RDFs) are required for certain activities in all GRSG habitat. RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each RDF cannot be fully assessed until the project level when the project location and design are known. Because of site-specific circumstances, some RDFs 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 in RDFs would require that at least one of the following be demonstrated in the NEPA analysis associated with the project/activity:

- A specific RDF 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 an RDF be varied or rendered inapplicable;
- An alternative RDF is determined to provide equal or better protection for GRSG or its habitat;
- A specific RDF will provide no additional protection to GRSG or its habitat.

### PROPOSED PLAN

#### General RDFs

The following RDFs would apply to development in all programs within PHMA, GHMA and OHMA consistent with applicable law.

RDF Gen 1: Locate new roads outside of GRSG habitat to the extent practical.

RDF Gen 2: Avoid constructing roads within riparian areas and ephemeral drainages. Construct low-water crossings at right angles to ephemeral drainages and stream crossings (note that such construction may require permitting under Sections 401 and 404 of the Clean Water Act).

RDF Gen 3: Limit construction of new roads where roads are already in existence and could be used or upgraded to meet the needs of the project or operation. Design roads to an appropriate standard, no higher than necessary, to accommodate intended purpose and level of use.

RDF Gen 4: Coordinate road construction and use with ROW holders to minimize disturbance to the extent possible.

RDF Gen 5: During project construction and operation, establish and post speed limits in GRSG habitat to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.

RDF Gen 6: Newly constructed project roads that access valid existing rights would not be managed as public access roads. Proponents will restrict access by employing traffic control devices such as signage, gates, and fencing.

RDF Gen 7: Require dust abatement practices when authorizing use on roads.

RDF Gen 9: Upon project completion, reclaim roads developed for project access on public lands unless, based on site-specific analysis, the route provides specific benefits for public access and does not contribute to resource conflicts.

RDF Gen 10: Design or site permanent structures that create movement (e.g., pump jack/ windmill) to minimize impacts on GRSG habitat.

RDF Gen 11: Equip temporary and permanent aboveground facilities with structures or devices that discourage nesting and perching of raptors, corvids, and other predators.

RDF Gen 12: Control the spread and effects of nonnative, invasive plant species (e.g., by washing vehicles and equipment, minimize unnecessary surface disturbance; Evangelista et al. 2011). All projects would be required to have a noxious weed management plan in place prior to construction and operations.

RDF Gen 13: Implement project site-cleaning practices to preclude the accumulation of debris, solid waste, putrescible wastes, and other potential anthropogenic subsidies for predators of GRSG.

RDF Gen 14: Locate project related temporary housing sites outside of GRSG habitat.

RDF Gen 15: When interim reclamation is required, irrigate site to establish seedlings more quickly if the site requires it.

RDF Gen 16: Utilize mulching techniques to expedite reclamation and to protect soils if the site requires it.

RDF Gen 17: Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.

RDF GEN 18: When authorizing ground-disturbing activities, require the use of vegetation and soil reclamation standards suitable for the site type prior to construction.

RDF GEN 19: Instruct all construction employees to avoid harassment and disturbance of wildlife, especially during the GRSG breeding (e.g., courtship and nesting) season. In addition, pets shall not be permitted on site during construction (BLM 2005b).

RDF GEN 20: To reduce predator perching in GRSG habitat, limit the construction of vertical facilities and fences to the minimum number and amount needed and install anti-perch devices where applicable.

RDF GEN 21: Outfit all reservoirs, pits, tanks, troughs or similar features with appropriate type and number of wildlife escape ramps (BLM 1990; Taylor and Tuttle 2007).

RDF GEN 22: Load and unload all equipment on existing roads to minimize disturbance to vegetation and soil.

In addition to the General RDFs, the following resource programs will include the following program specific RDFs applicable to PHMA, GHMA and OHMA consistent with applicable law:

#### **Lands and Realty\***

RDF LR-LUA 1: Where new ROWs associated with valid existing rights are required, co-locate new ROWs within existing ROWs or where it best minimizes impacts in GRSG habitat. Use existing roads or realignments of existing roads to access valid existing rights that are not yet developed.

RDF LR-LUA 2: Do not issue ROWs to counties on newly constructed energy/mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.

RDF GEN 3: Where necessary, fit transmission towers with anti-perch devices (Lammers and Collopy 2007) in GRSG habitat.

\*These RDFs also apply to other land use authorizations such as leases and permits.

#### **Fuels and Fire Management**

RDF WFM 1: Power-wash all firefighting vehicles, including engines, water tenders, personnel vehicles, and all-terrain vehicles (ATVs), prior to deploying in or near GRSG habitat to minimize the introduction and spread of undesirable and invasive plant species.

RDF WFM 2: Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.

RDF WFM 3: Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species by planting perennial vegetation (e.g., green-strips) paralleling road rights-of-way.

#### **Fluid Minerals RDFs**

RDF Lease FM 1: Co-locate power lines, flow lines, and small pipelines under or immediately adjacent to existing roads (Bui et al. 2010) in order to minimize or avoid disturbance.

RDF Lease FM 2: Cover, create barriers, or implement other effective deterrents (e.g., netting, fencing, birdballs, and sound cannons) for all ponds and tanks containing potentially toxic materials to reduce GRSG mortality.

RDF Lease FM 3: Require installation of noise shields to comply with noise restrictions (see Action SSS 7) when drilling during the breeding, nesting, brood-rearing, and/or wintering season. Require applicable GRSG seasonal timing restrictions when noise restrictions cannot be met (see Action SSS 6).

RDF Lease FM 4: Ensure habitat restoration meets GRSG habitat objectives (Table 2-2) for reclamation and restoration practices/sites (Pyke 2011).

RDF Lease FM 5: Maximize the area of interim reclamation on long-term access roads and well pads, including reshaping, topsoil management, and revegetating cut-and-fill slopes.

RDF Lease FM 6: Restore disturbed areas at final reclamation to the pre-disturbance landforms and meets the GRSG habitat objectives (Table 2-2).

RDF Lease FM 7: Use only closed-loop systems for drilling operations and no reserve pits within GRSG habitat.

RDF Lease FM 8: Place liquid gathering facilities outside of GRSG habitat. Have no tanks at well locations within GRSG habitat to minimize vehicle traffic and perching and nesting sites for aerial predators of GRSG.

RDF Lease FM 9: In GRSG habitat, use remote monitoring techniques for production facilities and develop a plan to reduce vehicular traffic frequency of vehicle use (Lyon and Anderson 2003).

RDF Lease FM 10: Use dust abatement practices on well pads.

RDF Lease FM 11: Cluster disturbances associated with operations and facilities as close as possible, unless site-specific conditions indicate that disturbances to GRSG habitat would be reduced if operations and facilities locations would best fit a unique special arrangement.

RDF Lease FM 12: Apply a phased development approach with concurrent reclamation.

RDF Lease FM 13: Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus (Dougherty 2007).

RDF Lease FM 14: In GRSG habitat, remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat (Doherty 2007):

- Overbuild size of ponds for muddy and non-vegetated shorelines
- Build steep shorelines to decrease vegetation and increase wave actions
- Avoid flooding terrestrial vegetation in flat terrain or low lying areas

- Construct dams or impoundments that restrict down slope seepage or overflow
- Line the channel where discharge water flows into the pond with crushed rock
- Construct spillway with steep sides and line it with crushed rock.
- Treat waters with larvicides to reduce mosquito production where water occurs on the surface

RDF Lease FM 15: Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.

### **Locatable Minerals**

RDF LOC 1: Install noise shields to comply with noise restrictions (see Action SSS 7) when drilling during the breeding, nesting, brood-rearing, and/or wintering season. Apply GRSG seasonal timing restrictions when noise restrictions cannot be met (see Action SSS 6).

RDF LOC 2: Cluster disturbances associated with operations and facilities as close as possible, unless site-specific conditions indicate that disturbances to GRSG habitat would be reduced if operations and facilities locations would best fit a unique special arrangement.

RDF LOC 3: Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus (Dougherty 2007).

RDF LOC 4: Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat (Doherty 2007):

- Overbuild size of ponds for muddy and non-vegetated shorelines
- Build steep shorelines to decrease vegetation and increase wave actions
- Avoid flooding terrestrial vegetation in flat terrain or low lying areas
- Construct dams or impoundments that restrict down slope seepage or overflow
- Line the channel where discharge water flows into the pond with crushed rock
- Construct spillway with steep sides and line it with crushed rock.
- Treat waters with larvicides to reduce mosquito production where water occurs on the surface

RDF LOC 5: Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.

RDF LOC 6: Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.

RDF LOC 7: Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.

**Comprehensive Travel and Transportation Management**

RDF CTTM 1: Rehabilitate roads, primitive roads, and trails not designated in approved travel management plans.

RDF CTTM 2: Reclaim closed duplicate roads by restoring original landform and establishing desired vegetation in GRSG habitat in accordance with GRSG habitat objectives (Table 2-2) as identified in travel management planning.