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5 **Appendix C**
6 **South Dakota Field Office Mitigation Guidelines**

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15 **Introduction**

16 South Dakota Field Office (SDFO) Mitigation Guidelines are a compilation of practices employed by the Bureau of
17 Land Management (BLM) to mitigate impacts from surface disturbance. They apply to activities such as road or
18 pipeline construction, range improvements, and permitted recreation activities. The guidelines are designed to
19 protect resources such as soil, water, air, vegetation, wildlife habitat, and cultural or historic properties. The
20 guidelines are not land use decisions; rather they are examples of mitigation measures that could be applied, as
21 appropriate, based on site-specific National Environmental Policy Act (of 1969) (NEPA) analysis for individual
22 proposals.

23 The guidelines are presented as an appendix of the Resource Management Plan (RMP) for easy reference, as they
24 apply to many resources and derive from many laws. This list included in the appendix is not comprehensive and is
25 intended to be used as a guide for appropriate project planning, design, and implementation within the SDFO.
26 Because mitigation measures change or are modified, based on new information, the guidelines are updated
27 periodically for SDFO.

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41 **Purpose**

42 The purpose of the SDFO Mitigation Guidelines is (1) to reserve, for BLM, the right to modify the operations of all
43 surface and other human presence disturbance activities as part of the statutory requirements for environmental
44 protection, and (2) to inform a potential lessee, permittee, or operator of the requirements that must be met when
45 using BLM-administered public lands.

46 Application of the mitigation guidelines to all surface and other human presence disturbance activities concerning
47 BLM-administered public lands and resources will also provide more uniformity in mitigation than has occurred in
48 the past. These guidelines are primarily intended for the purpose of consistency in the ways requirements are
49 determined for avoiding and mitigating environmental impacts and resource and land use conflicts. Consistency in
50 this sense does not mean that identical requirements would be applied for all similar types of land use activities that
51 may cause similar types of impacts. It also does not mean that the requirements or guidelines for a single land use
52 activity would be identical in all areas. Individual measures may not be appropriate for every situation and would be
53 analyzed on a case-by-case basis.

54 Those resource activities or programs currently without a standardized set of permit or operation stipulations can use
55 the mitigation guidelines as stipulations or as conditions of approval, or as a baseline for developing specific
56 stipulations for a given activity or program.

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Mitigation Goals

Mitigation employs measures that have been developed to reduce environmental impacts associated with certain
types of activities. Best Management Practices (BMPs) are mitigation measures designed to reduce undesirable
impacts to the environment. Incorporation of mitigation can typically result in a more efficient environmental
review process, increased operating efficiency, reduced reclamation, and less environmental impacts (The Gold
Book, 2007).

Mitigation Objectives

1. Use avoidance or relocation as the preferred strategy for reducing potential adverse effects.
2. Employ as much mitigation as possible during planning.
3. Minimize surface disturbance effects of operations and maintain the reclamation potential of the site through design, construction, and other practices/techniques.
 - a. The total disturbance area would be kept to a minimum and located in an area that would reduce environmental impacts as much as possible. Surface disturbance would be co-located where feasible; locate sites using existing roads and previously disturbed sites unless it would cause or aggravate an erosion problem. Locate all linear facilities in the same trenches (or immediately parallel to), and at the same time.
 - b. Use two-track (primitive) roads whenever possible.
 - c. Access roads would be no wider than 18 feet and located in an area suitable for year-round use. The Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development: The Gold Book has further guidance for the design of roads, utilities, and oil and gas operations Best Management Practices.
 - d. Interim and final reclamation would occur as soon as possible following disturbance. Interim reclamation would be completed to within a few feet of facilities.
 - e. Whenever practical, bury utilities. Use ditch witches or wheel trenchers (versus back hoes) wherever practical for installation of buried lines to minimize disturbance area.
 - f. Vegetation would be removed only when necessary. Mowing vegetation is preferred.
 - g. The use of alternative techniques, for example, directional drilling, drilling multiple wells from the same pad, co-mingling, recompletion, using existing well pads, is encouraged to minimize surface impacts from oil and gas development.
 - h. Mechanized equipment use causing rutting to a depth greater than 4 inches would not be allowed.
4. **Reduce impacts to soil and water resources. Eliminate sources of ground water and surface water contamination.**
 - a. Operations would avoid sensitive resources including riparian areas, floodplains, waterbodies, and areas subject to erosion and soil degradation. Vehicle movement in sensitive areas would be confined to the smallest reasonable area. Off-road vehicle travel may be restricted.
 - b. Reduce erosion, soil loss, and impacts to water quality by diverting storm water and trapping sediment during activity with erosion/sedimentation control measures.
 - c. There would be no adverse impacts from well water discharge to soils; discharge water may need to be impounded, re-injected, or applied as beneficial use (if it contains less than 10,000 ppm TDS).
 - d. Produced water, reserve pits, and mud pits would be lined with an impermeable liner if site material is porous and not placed in fill material or in natural watercourses; pits may not be cut or trenched. Plastic liners must have a minimum 140 lb/in² burst strength, 30 lb tear strength, and be installed over material that won't tear or puncture the liner. Pits would be at least 50 % below ground level and designed to contain all material with a minimum of 2 feet freeboard.
 - e. Use pitless or closed-loop drilling technology. Dispose of drilling fluids, mud, and cuttings in approved disposal areas.
 - f. The pipeline must be tested for leaks prior to backfilling the trench. Pre-clean pipelines prior to hydrostatic testing.
 - g. Avoid well pad designs with cut or fill material in excess of 10 vertical feet.
 - h. Diesel fuel would not be used in fracking fluids that have the potential for drinking water contamination.
 - i. Activity may be restricted during wet or frozen conditions.
 - j. Surface casing would be installed through the Fox Hills Formation to protect domestic ground water sources from contamination.

- k. No adverse changes in quality of receiving surface or ground waters would occur. Control sources of contamination to protect surface and ground water quality. See the **Monitoring Appendix** for specific guidelines.
- l. Properly design (grade, sloped, drainage structures, placement, etc.), grade (only when necessary to correct erosion, rutting, comfort, and/or safety), and maintain roads and trails. Design roads to use sites with stable geology, well-drained soils, and natural benches; avoid erodible and low bearing strength soils. Roads would follow the contours of the terrain; avoid long, steep road grades. Road ditches would have flat bottoms and water turn-outs to prevent ditch erosion.

5. Manage Invasive Species

- a. The project area would be inventoried for invasive plants on/or adjacent to the site before initial activities. See the **Monitoring Appendix** for specific guidelines.
- b. Develop an invasive species management plan if appropriate.
- c. Control invasive species utilizing an integrated pest management approach.
- d. Do not allow invasive species to be transported offsite without appropriate disposal measures.

6. Reduce impacts to air resources

- a. Use alternative energy sources (e.g., solar and [or] wind power) on new water resource developments and convert power sources for existing water-well developments currently using generators on all BLM-administered lands where economically and physically feasible.
- b. Consider road surfacing to minimize erosion and impacts to air quality (e.g. pit-run gravel over scoria).

7. Develop and implement a mitigation monitoring and reporting strategy

- a. Conduct compliance and effectiveness monitoring in accordance with a BLM approved monitoring protocol. An on-site inspection by the BLM is required within one year of the disturbance. See the **Monitoring Appendix** for specific guidelines.
- b. Evaluate monitoring data for compliance with the mitigation appendix.
- c. Document and report monitoring data. Recommend revised mitigation strategies where appropriate.
- d. Implement revised mitigation strategies where appropriate.
- e. Continue the process of monitoring, evaluating, documenting/reporting, and implementing, until mitigation goals are achieved.

Guidelines for Specific Activities

1. Waterbody Crossing Guidelines

- a. Stream crossings would be designed to minimize current and future impacts, including impedance of flow, and would not block, dam, or change any natural drainage.
- b. Multiple crossings would be avoided where possible.
- c. Site reclamation measures will be initiated as soon as a particular area is no longer needed for construction.
- d. Erodible material would not be placed in stream channel. Soil stockpiles would be located above the high water mark.
- e. Crossings would be designed at a right angle to the main channel.
- f. Design for adequate aquatic species passage.
- g. Timing of construction and adjustment of flow conditions may be required to accommodate aquatic species.
- h. Linear Facilities:
 - i. Perennial streams would be crossed using bore crossing (directional drill) or other methods as technology allows which would reduce erosion, sedimentation, and impacts to streambanks and riparian areas.

- 1 ii. Any water body with flowing water at the time of construction (including intermittent and ephemeral
2 streams) would require an isolated crossing method such as bore crossing (directional drill) or open-cut
3 dry crossing methods (e.g. dam-and-pump or flume methods) to reduce erosion and sedimentation.
4 Diversion of stream flow would be required prior to and during trenching, backfilling, and compaction
5 for open-cut crossing construction using an impermeable diversion and techniques to avoid erosion and
6 sedimentation.
- 7 iii. Open-cut non-isolated (wet) crossings would not be allowed if the intermittent or ephemeral stream has
8 any surface flow at any time during construction activities which includes trenching, backfilling,
9 compaction, and re-stabilization.

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11 **2. Culverts (Refer to The Gold Book for installation details)**

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- 13 a. Install culverts to prevent erosion, scour, seepage, and failure.
- 14 b. Install culverts to conform to the natural streambed and slope. Install culverts slightly below normal
15 stream grade.
- 16 c. Use drop structures, rock armor, downspouts, and energy dissipaters to reduce erosion, as long as this does
17 not impede aquatic wildlife passage.
- 18 d. Install culverts to ensure fish and aquatic wildlife passage in all fish-bearing streams. Culverts would
19 follow any additional guidelines and requirements provided by the Field Office Biologist and/or BLM and
20 in coordination and cooperation with the. Flat bottom or bottomless culverts are preferred for fish passage
21 as they reduce velocity and can be bedded with the natural substrate so that it functions like a streambed.
- 22 e. Culverts would extend at least 1-foot beyond the toe of slope.
- 23 f. Perform work at low flow and divert flow to minimize erosion and turbidity.
- 24 g. Maintain culverts and fill; protect inflow from plugging.