

FORM 9CN – ATTACHMENT (1)

Section 1 Definitions:

- a. Topsoil. Unconsolidated soil material on the surface supporting plant life and containing the bulk of the plant roots.
- b. Fill Material. Subsoil and lithic material excavated from cuts and used as road base fill.
- c. Pitched Grade. Short section of unusually steep road grade. The steep section is compensated for by adjacent relatively flat sections. The pitched grade should not exceed 60 feet horizontal distance and 16% grade.
- d. Access Road. Road constructed for the purpose of moving men and equipment into and within the exploration area.
- e. Temporary Road. Relatively short segment of road leading to the drill pad or drill hole location.

Section 2 Construction of Roads and Drill Pads:

- a. Construction of roads and drill pads on steep hillsides (i.e., greater than 40% slopes) must be avoided where possible. If roads or drill pads must be constructed on such sites, the cut-and-fill necessary to provide access should be minimized.
- b. Existing roads, if available, or travel over the terrain where possible should be utilized to minimize the construction of new roads. Road building which results in the least soil disturbance and the smallest cuts and fills provides the best conditions from the standpoint of erosion control and reclamation.
- c. Unnecessary disturbances may be prevented by 1) avoiding construction during muddy conditions, 2) minimizing road and drill pad widths to be consistent with access and operation requirements, and 3) preventing discharge of vehicle lubricants, fuels, or refuse upon the land.
- d. Road grades should not exceed 10%. Pitched grades are acceptable where water-breaks are constructed at the crest, middle, and toe of the grade.
- e. Approximately 6 inches of the surface topsoil should be windrowed to the side of the roadbed. The windrow should be located on the side of the road that affords the greatest protection from erosion. Windrows should have periodic breaks to allow for drainage.
- f. Access roads should be constructed in accordance with Attachment (2), Illustration 1. Temporary roads may be constructed as shown in Attachment (2), Illustration 3.
- g. Roads must not be constructed up a stream channel or so close that the material will spill into the channel. Disturbance of stream channels must be kept to a minimum.
- h. Streams should be crossed in a perpendicular manner unless angling down to the stream bed results in less potential stream bank erosion. Bridges, culvert crossings, or ford entrances and exits should be constructed in a manner to prevent water from flowing down the roadway.
- i. Ditches along side access roads should be constructed as shown in Attachment (2), Illustration 1. Ditch relief cross drains should be spaced according to grade. On grades of 4% or greater, water-breaks should be installed as specified in Attachment (2), Illustration 2.

- j. Culverts should be installed at all stream crossings that require the placement of fill material into the channel. Culverts must be covered with a minimum of 12 inches of material

Section 3 Reclamation

a. Filling, grading and contouring.

- (1) Roadways, drill pads, and exploration cuts constructed to facilitate exploration should be rough-graded to restore the approximate original contours. First the fill and then the topsoil material should be replaced in the cut.
- (2) Compacted areas caused by heavy equipment should be scarified to a depth not less than 8 inches prior to replacing fill or topsoil material.
- (3) Roads and exploration cuts constructed perpendicular to the contour such that surface runoff will flow down the road or cut after the fill and topsoil materials have been replaced should be "reclaimed" with water-breaks as shown in Attachment (2), Illustration 2.
- (4) Restoring side hill access roads and drill pads cut on slopes greater than 40% should be accomplished by reducing the cut and fill slopes to a more favorable grade for stabilization and revegetation (see Attachment (2), Illustration 3). Material above the cut slope should be dragged down onto the roadbed during cut slope reduction. Material forming the fill should be drawn back upslope, onto the roadbed during fill slope reduction. Following cut and fill reduction the final surface configuration will allow surface runoff down the natural slope rather than down the original roadbed. Disturbance to lands adjacent to the road or drill pad must be kept to a minimum.
- (5) Culverts and other installed structures must be removed.

b. Revegetation of roads, drill pads, and exploration cuts.

- (1) Seeding should be performed in the fall after October 15 or in the spring before May 1, but should not be performed when the ground is frozen. Seed should be drilled 1/2 to 3/4 inches deep in the soil. If drilling is not possible the seed should be broadcast with a rotary spreader and covered by harrowing, dragging, or hand raking. Based on site specific conditions, one of the below listed seed mixtures and rates may be planted.

(A) SANDY SOILS AND ROCKY LANDS

	lb/acre (PLS)	
	Drilled	Broadcast
Streambank wheatgrass	5	10
Thickspike wheatgrass	6	12
Indian ricegrass	1	2

(B) LOAMY SOILS

	lb/acre (PLS)	
	Drilled	Broadcast
Streambank wheatgrass	4	8
Thickspike wheatgrass	4	8
Western wheatgrass	4	8

C) CLAYEY SOIL, SALINE SOILS AND SOILS WITH WATER TABLE WITHIN 3 FEET OF SURFACE

	lb/acre (PLS)	
	Drilled	Broadcast
Western wheatgrass	12	24

(D) CLAYEY SOILS AND SALINE SOILS IN THE BIG HORN BASIN

	lb/acre (PLS)	
	Drilled	Broadcast
Western wheatgrass	12	24
Gardner saltbush	2	4

(2) Mulch should be utilized to control erosion on recontoured access roads, drill pads, and exploration cuts located on steeply sloping terrain (with a slope greater than 4:1), or sites having sandy topsoil material, or sites located in sand dune areas, or sites on the windward crest of hilltops.

(A) Dry mulch should be utilized where slope conditions will allow the mulch to be anchored mechanically on the contour:

- (i) If the soil surface is compacted it should be loosened to a depth of about 2-3 inches to obtain proper anchoring. This should be done before seeding with a chisel, cultivator, or disk.
- (ii) Native hay or small grain straw should be spread uniformly over the area at a rate of two tons per acre. Native grass hay is preferable to grain straw because it tends to have a stiffer stem, better resistance to deterioration, and freedom from seeds that often compete with planted seedlings. The mulch is best anchored immediately after dirt-work while the soil is still loose.
- (iii) The mulch should be anchored with a straight coulter machine to a depth of 2 inches with a minimum of 12 inches between coulters. If a straight coulter machine is not available, a disk should be used for anchoring. It should be operated so as to incorporate the mulch into the soil only enough to provide anchoring. When anchoring with a straight coulter machine, seeding should be done prior to mulching. When anchoring with a disk, seeding should be done following mulching and anchoring. Mulch on small sites should be anchored by hand with a square spade.

(B) On steep slopes where mechanical anchoring of dry mulch on the contour becomes unfeasible due to operator safety, such other means of erosion control as netting, erosion control blankets, hydraulic mulching, etc. should be utilized.

Section 4 Mud Pits

The uncontrolled discharge of drilling mud onto the surface of the ground should be prevented by the use of portable or excavated mud pits. These pits should be sized to contain all drilling mud cuttings and in the case of excavated mud pits the following reclamation measures should be taken:

- a. Topsoil saved during construction.
- b. Pit backfilled such that a mound is not created after settling has occurred.

- c. Topsoil replaced and area seeded.

For a portable mud pit, the cuttings should be spread thinly to avoid destroying the grass.

Section 5      Drill Hole Completion

- a. Artesian flow of groundwater to the surface must be eliminated by any plugging method sufficient to prevent adverse changes in water quality or quantity on a long-term basis.
- b. Drill holes which encounter groundwater shall be sealed to prevent adverse changes in water quality or quantity caused by communication between aquifers or between aquifers and zones of lower pressure.
- c. To ensure the safety of people, livestock, wildlife and machinery, drill holes must be securely capped at a minimum depth of 2 feet below either the ground surface or the collar of the hole, whichever is lower, and shall be filled with soil to the ground surface.

Signature of Applicant \_\_\_\_\_

Date \_\_\_\_\_