4B106

RMRS Rocky Mountain Remediation Services, L.L.C.
... protecting the environment

MEMORANDUM

DATE: March 20, 1996 5400.1

TO: M. R. Wood, Remediation Services (OU2), Bldg. T893B, X6689

FROM: M. B. Murdock, Ecology, Bldg. T893B, X3560

SUBJECT: MIGRATORY BIRD AND THREATENED AND ENDANGERED SPECIES CLEARANCE FOR OU2 TRENCHES PROJECT, AND REVEGETATION RECOMMENDATIONS UPON PROJECT COMPLETION - MBM - 028 - 96

Ecology personnel have surveyed the Operable Unit 2 trenches area for migratory bird, threatened and endangered species, and wetlands concerns. No concerns with these issues were identified in the work area. earth moving work does not start by April 22, 1996, however, a migratory bird survey renewal may be required. With the nesting season approaching, after that date, nesting surveys must be completed every two weeks until work begins.

Ecology was also requested to develop revegetation recommendations for this project. Because it is in an area classified as xeric tallgrass prairie, a rare plant community, it is advisable to limit surface disturbance to only the area actually necessary. DOE Policy 9-19 for Rocky Flats establishes the need for revegetation "as quickly as possible" after completion of a project. This Policy also requires erosion controls for all construction activities at the Site. DOE Order 6430.1A establishes requirements that :

- The area beyond the construction limits shall not be unnecessarily disturbed.
- Disturbance of the natural terrain shall be minimized during site grading. Where feasible, natural flora on or adjacent to the construction site shall be preserved and protected from vehicular and pedestrian traffic with temporary fencing.
- In locations where topsoil is not readily available, all topsoil within the area of disturbance shall be scalped and stockpiled in a designated location, for later use in landscaping and revegetation efforts.
- Natural flora in unlandscaped areas shall be reestablished where disturbed by constriction activities.

To comply with Policy 9-19, and DOE Order 6430.1A, ecology recommends that topsoil be scalped from the areas where storage piles may contaminate surface soils. This topsoil should be stockpiled in an unaffected location as near as possible to the work site to eliminate unnecessary haulage. Recommended revegetation techniques for the Site, and a recommended seed mixture are attached.

Should you have questions or require further information, please contact me at extension 3560.

MBM:mbm

Attachments:
As Stated

cc:
J. D. Krause
ERPD Records File (2)

REVEGETATION STRATEGIES

The general revegetation recommendations for different revegetation needs at the Site have been developed by Site Ecologists based on recent experience at the Site. Customized seed mixtures for each site help ensure that appropriate species are planted, and that non-endemic species are not introduced. The current revegetation strategy is to restore the native prairie grasslands as closely as possible to preexisting conditions, rather than to change the character through reclamation and remediation. As exhibited by the "reclamation" acreage in the southeastern portion of the Site, planting aggressive non-endemic species at the Site can drastically change the native prairie. Even after two decades, the planted species have allowed little encroachment of native forbs and grasses into the reclaimed area.

Nylon netting has been prohibited for revegetation efforts at the Site. While the netting is an efficient means of stabilizing the mulch during the high winds often experienced at the Site, the clear evidence of songbird mortality caused by this netting has led Site ecologists to prohibit the use of netting. Killing songbirds is specifically prohibited by the Migratory Bird Treaty Act (MBTA), therefore, use of netting became a compliance issue.

Revegetation efforts have yielded mixed results for different revegetation efforts at the Site. Evaluation of the success of some early revegetation efforts has provided some useful information to help modify subsequent efforts. Some projects have found themselves short of sufficient topsoil for complete re-topsoiling of the disturbance and have attempted to substitute hydromulch for soil. This has not proved to be a particularly viable solution. Availability of topsoil has often been a problem once a project reaches the final phase of revegetation. Occasionally insufficient topsoil has been reserved during the first phase of new construction, and sufficient topsoil is unavailable for successful revegetation. More commonly, however, revegetation is the final step of remediation in a decontamination and decommissioning project at a location that was initially disturbed decades ago. At the time of the original construction at the Site, no thought was given to stockpiling topsoil for future use, so topsoil supplies are unavailable. If no topsoil is available, Site ecologists recommend procurement of topsoil from off-site to allow placement of a minimum of 6 to 8 inches of topsoil over the subsoil at the disturbance. Purchasing topsoil from off-site often adds unanticipated expense to the final revegetation costs, and has recently caused some funding problems, and delays of project completion and closure.

Once a disturbance has been filled and re-contoured, that the subsoil should be ripped or scarified to a depth of 8 inches, to relieve soil compaction from heavy equipment, before topsoil placement. Topsoil should then be placed as evenly as possible in a 6- to 8-inch layer for imported soil, or as evenly as possible where native soil was reserved from the site. If reserved soil is used, all that is available should be applied. Care should be taken during topsoil application to avoid compaction of this layer.

Subsequent to topsoil placement, fertilizer should be applied at a rate of 60 pounds of nitrogen and 60 pounds of phosphorus per acre. Seed should then applied directly into the topsoil. Seeding may then be performed using a no-till drill, or broadcast seeding, depending on slope, areal extent of the disturbance, soil conditions (much of the soil at the Site is too rocky for drill-

seeding), and other site-specific factors. If the seed has been broadcast, the reseeded area should be drag-chained or raked to ensure that the seed is buried prior to mulching.

Certified weed-free hay or straw mulch can be used on small areas, or in locations protected from the wind. (Excelsior mulch is also an acceptable material since wood fiber is also weed-free.) Mechanical crimping of hay or straw mulch is normally recommended to anchor it to the soil. In large areas, on steep slopes, and where high winds are commonly experienced at the Site mulch may be dislodged, in such areas hydromulching is recommended. Hydromulch should be applied as a separate, final step. Application of seed within the hydromulch is not an accepted practice at the Site. Only mulches bound by vegetable-based binders (tackifiers) are allowed for use on the Site, due to previous problems with petroleum-based binders leaching into the groundwater. Tackifying agents found to be "environmentally friendly" and chemically acceptable for use at the site are those based on guar gum, or Psyllium (alpha plantago). The product known by the brand name "SoilGuard" was also found to be chemically acceptable. Wood fiber or excelsior mulch material provides a good weed-free mulch fiber that can be combined with the tackifiers for good effect. Several products of this sort are available on the open market. Reprocessed newsprint-type wood fiber mulch has not yielded particularly good results at the Site, however. The thick clumping and persistence of the papier-mache-like product may have inhibited good plant growth in one case.

Experience has shown that hydromulching to a thickness of 1 to 1.5 inches is an optimum application rate. Where steep grades occur, or when high winds can be expected before the vegetation is fully established, hydromulching is highly recommended. Limited or nonexistent success of a revegetation effort will require repeated attempts until successful revegetation is attained.

SUGGESTED SEED MIXTURE FOR OU2 REVEGETATION

Species (Variety)	Application Rate (lbs/ac PLS)[1]
Big Bluestem - Kaw (*Andropogon gerardii*)	3.0
Side-oats Grama - Vaughn (*Bouteloua curtipendula*)	2.0
Little Bluestem - Camper or Pastura (*Schyzachrium scoparium*[2])	1.5
Blue Grama (*Bouteloua gracilils*)	2.0
Thickspike Wheatgrass - Critana (*Agropyron dasystachyium*)	3.0
Weatern Wheatgrass - Arriba (*Agropyron smithii*)	3.0
TOTAL	14.5

1) Application rate fro drill seeding. This rate should be doubled fro broadcast seeding.

2) Synonymous with *Andropogon scoparius*

Approved Weed Free Hay/Straw Sources

COLORADO DEPAI
DIVISION OF PLANT INDUSTRY
700 KIPLING STREET, SUITE 4000
LAKEWOOD, COLORADO 80215
(303) 239-4149

1995 Weed Free Forage Crop Producers who have completed certification as of 8-8-95

[redacted]
Acres Certified: 10
Forage Type: Alfalfa & Grass

[redacted]
Acres Certified: 7
Forage Type: Alfalfa

[redacted]
Acres Certified: 25
Forage Type: Alfalfa/Grass

[redacted]
Acres Certified: 58
Forage Type: Grass Hay

[redacted]
Acres Certified: 35
Forage Type: Grass/Alfalfa

[redacted]
Acres Certified: 30
Forage Type: Grass Mix

[redacted]
Acres Certified: 45
Forage Type: Grass/Alfalfa

[redacted]
Acres Certified: 4.75
Forage Type: Alfalfa

[redacted]
Acres Certified: 58
Forage Type: Alfalfa

[redacted]
Acres Certified: 11
Forage Type: Garrison
Meadow Grass

[redacted]
Acres Certified: 15
Forage Type: Alfalfa

[redacted]
Acres Certified: 57
Forage Type: Grass/Alfalfa
Clover Mix
(Hay not for sale)

[redacted]
Acres Certified: 11
Forage Type: Grass Hay

[redacted]
Acres Cert. 1st inspec: 30.5
Acres Cert. 2nd inspec: 42
Forage Type: Alfalfa/Grass

[redacted]
Acres Certified: 117.7
Forage Type: Barley Straw

[redacted]
Acres Certified: 57
Forage Type: Wheatgrass
Brome
Bluegrass
Clover
Timothy

[redacted]
Acres Certified: 4.5
Forage Type: Grass/Alfalfa

[redacted]
Acres Certified: 7.5
Forage Type: Grass/Alfalfa

[redacted]
Acres Certified: 30
Forage Type: Brome/Orchard Grass/
Alfalfa

[redacted]
Acres Certified: 14
Forage Type: Alfalfa

[redacted]
Acres Certified: 50
Forage Type: Alfalfa

[redacted]

Acres Certified: 35
Forage Type: Mountain Grass

[redacted]

Acres Certified: 16
Forage Type: Alfalfa

[redacted]

Acres Certified 1st cut: 25.1
Acres Certified 2nd cut: 25.1
Forage Type: Alfalfa

[redacted]

Acres Certified: 60
Forage Type: Alfalfa

[redacted]

Acres Certified: 42
Forage Type: Orchard Grass/
Alfalfa

[redacted]

Acres Certified: 49
Forage Type: Grass/Alfalfa Mix

[redacted]

Acres Certified: 37.9
Forage Type: Grass

[redacted]

Acres Certified: 22
Forage Type: Grass/Alfalfa Mix

[redacted]

Acres Certified: 1.5
Forage Type: Alfalfa/Grass Mix

[redacted]

Acres Certified 1st Inspec.: 91
Acres Certified 2nd Inspec.: 82
Forage Type: Grass & Alfalfa

[redacted]

Acres Certified: 26
Forage Type: Grass/Alfalfa Mix

[redacted]

Acres Certified: 120.1
Forage Type: Alfalfa

[redacted]

Acres Certified: 10.5
Forage Type: Grass/Clover Mix

[redacted]

Acres Certified: 25
Forage Type: Alfalfa

8/8