



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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TO: File

THRU: Joe Helfrich, Permit Supervisor 

FROM: Priscilla Burton, Soils Reclamation Specialist 

RE: Soils Technical Analysis of the Waste Rock Site Expansion Amendment, Canyon Fuel Company, LLC, Skyline Mine, ACT/007/005-98F, Folder #2, Carbon County, Utah

SUMMARY:

Canyon Fuel, LLC, has submitted an amendment for expanding their current waste rock site to the size of 7.68 acres. This is an increase of 1.39 acres. The estimated additional capacity of the storage site is 47,000 C. Approximately 6,734 CY of waste will be added to the site annually. Therefore, the life expectancy of this expansion is six or seven years.

A survey of the site revealed approximately 2,197 yd³ of soil to be salvaged for reclamation, this is a shortfall of 2,915 yd³ to achieve the required 28 inch topsoil and subsoil cover depth over the non-acid, non-toxic waste rock. The plan calls for the purchase of the additional subsoil cover. This has been the operational plan for the existing site.

The amendment is recommended for approval.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.21, 817.200(c); R645-301-220, -301-411.

Analysis:

The amendment discusses the soil resources within the proposed GOP pile expansion area with an attachment to the appendix volume A-2 for the soils and vegetation section. Relevant soils resource information includes North Facing Slope and AML soils. Published soil survey

Relevant soils resource information includes North Facing Slope and AML soils. Published soil survey descriptions and current soil descriptions for topsoil and substitute topsoil are included in the amendment. The Analysis section discusses resource information as follows:

- Soil Survey Information
- Soil Characterization

Soil Survey Information

Soil survey information is presented from three separate sources as follows:

(1) *Natural Resource Conservation Service General, Third Order Soil Survey.* A section of the regional soils map and relevant portions of the Carbon County soil survey are reproduced from the Carbon County Soil Survey, published by the United States Department of Agriculture, Soil Conservation Service, National Cooperative Soil Survey, issued in June 1988.

(2) *Past Site Specific Soil investigation.* Soil survey as contained in the presently approved Mine Reclamation Plan, Appendix A-2, Soils and Vegetation, "Report of Vegetation and Soils, Proposed Waste Rock Disposal Site, Skyline Mine, November 1981." This soil survey was prepared by Dr. Stanely L. Welsh and Dr. Joseph b. Murdock of Endangered Plants Studies, Inc. with aid from the Soil Conservation Service, Carbon County.

(3) *Current Site Specific Soil Investigation.* A site specific soil investigation was performed for soils within the planned expansion area on August 26, 1998 and prepared by Mr. Chris Hansen, Canyon Fuel, LLC Skyline Mine. Three soil pits were hand dug into the slopes of the expansion area and soil horizons were described (Plate 3.2.8-2).

The current site specific soil investigation covers approximately 0.7 acres of the total 1.39 acres expansion area and includes three separate areas as follows:

- 0.14 acre area - included in the site specific soil investigation is the undisturbed vegetated slope east of the existing pile (pits GPE-1 and GPE-2, Plate 3.2.8-2).
- 0.23 acre area - the expansion area will include a portion of an AML reclaimed slope which is north of the existing gob pile (GPE-3, Plate 3.2.8-2).
- 0.31 acre area - reclaimed slope of the existing gob pile where soil cover is already placed.
- 0.71 acres where no soil investigation was performed - active road right-of-way which

is located northwest of the gob pile where soil resources are limited or non-existent.

North Facing Slope

Soil Log field data sheets contain soil descriptions for pits GPE-1 and GPE-2 for the north facing slope east of the existing gob pile. Soil descriptions suggest that these soils resemble the Midfork Family soils; however, the soils are much thinner than those described by the Carbon County Soil Survey. Evidence of a Mollic epipedon is weak based on color, thickness and structure.

The soils logs show an A horizon underlain by a C1 horizon. . Descriptions for the C1 horizons for both GPE-1 and GPE-2 indicate these horizons may actually be a second A horizon and part of a Mollic epipedon, particularly for GPE-2. Since these soils appear to have been disturbed in the past, mixing and thinning of the surface soils will have partially obscured the Mollic epipedon.

AML Soils

The soils log shows that these soils are imported fill used for reclamation. Therefore, these soils are classified as substitute topsoil. These soils are silty loam with no developed structure and a rock content less than 10 % that consists mainly of pebbles. Vegetation is occasional sage dominated by grasses, including cheat-grass.

Soil Characterization

The soil horizons at each sampling location were sampled according to the State of Utah Division of Oil, Gas and Mining (DOG M) guidelines for topsoil and overburden¹. Characteristics of the topsoil and substitute topsoil are suitable for use in reclamation of the site.

Findings:

The information provided is adequate for the purposes of the regulations.

¹Leatherwood, J., and Duce, D., 1988. Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining. State of Utah Department of Natural Resources, Division of Oil, Gas and Mining.

OPERATION PLAN

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

Analysis:

The amendment discusses the proposed GOP pile expansion area with an attachment to the appendix volume A-2 for the soils and vegetation section. Relevant soils resource information is used for projecting soil salvage volumes. The Analysis section discusses resource information as follows:

- Topsoil and Subsoil Removal
- Topsoil Storage

Topsoil and Subsoil Removal

The amendment states that the expanded waste site contains approximately 2,197 yd³ of topsoil and substitute topsoil which will be salvaged for later reclamation. According to the four areas identified in the soil resource section, soil salvage volumes by area are shown as follows for the 1.39 acre expansion area:

- 0.14 acre area - vegetated slope east of the existing pile (345 yd³).
- 0.23 acre area - AML reclaimed slope north of the existing gob pile (1,099 yd³).
- 0.31 acre area - reclaimed slope of the existing gob pile (753 yd³).
- 0.71 acres active road right-of-way - no soil salvage (0 yd³).

The 2,197 cu yds of topsoil will be used to cover 1.39 acres of disturbance, and will amount to a depth of 12 inches of topsoil over the site.

Topsoil Storage

Map 3.2.8-2 shows the storage of the topsoil on a gentle slope on top of the reclaimed waste rock site. The topsoil will be protected by strawbales.

Findings:

The information provided is adequate for the purposes of the regulations.

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Coal Mine Waste

The expanded waste rock site will have an increased capacity of 47,000 CY (total storage volume will be 178,000 CY). Approximately 6,734 CY will be brought to the site. Therefore the life expectancy of the site is 6 or 7 years. The next permit renewal will likely require discussion of additional waste rock disposal space.

Regulation R645-301-553.252 requires that *coal mine waste will be covered with a minimum of four feet of the best available, nontoxic and noncombustible material*. The presently approved plan calls for 12 inches of topsoil and 16 inches of subsoil cover to be placed over 20 inches of non-toxic, non-acidic waste material (page 4-38a), a total of 50 inches of non-toxic, non-acidic cover over the refuse. As discussed in the section above, one foot of topsoil has been located and designated for salvage during this expansion. To achieve the required depth of cover over the 1.39 acres of expansion, 2,915 yd³ of subsoil will be purchased from a commercial source. Purchase of subsoil is presently approved in the MRP. The subsoil calculations are as follows:

1.39 acre area x 43,560 sq ft/ac = 60,548 sq ft
16 inches subsoil = 1.3 ft
1.3 ft x 60,548 sq ft = 78,712 cubic feet of subsoil
78,712 cu ft divided by 27 cu ft/ cu yd = 2,915 cu yd subsoil to be purchased

Subsoil will be tested before use according to Table 6 of the Division's Guidelines. In searching for the subsoil material, the permittee is reminded that although DOGM's topsoil guidelines suitability criteria considers >30% (by volume) rock fragments (for both gravels <3"

in size and cobbles 3 to 10" in size) to be unacceptable, and >10% stones and boulders >10" in size to also be unacceptable, the recent standard preference by DOGM is to salvage "**native soils**" with "**intrinsic rock content**". Ultimate site reclaimability using these rocky soils could enhance reclamation success by providing an environment similar to native conditions. Higher rock content soils provide for a more stable reclaimed surface, aid in water harvesting and ultimate water holding capacity of interstitial soils, and create wildlife habitat and niches on the surface were surface boulders and larger cobble sized rocks are placed.

Findings:

The information provided is adequate for the purposes of the regulations.