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# TECHNICAL MEMORANDUM

## Utah Coal Regulatory Program

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May 12, 2011

TO: Internal File

THRU: Joe Helfrich, Team Lead 

FROM: Priscilla Burton, CPSSc, Environmental Scientist III *pwb km 805*

RE: Permit Application – Kinney #2 Mine, Carbon Resources, LLC, Carbon County, C/007/047, Task ID #3823

**SUMMARY:**

The plan is recommended for approval based upon my review of the soils handling information provided on March 21, 2011 and that provided electronically on May 10, 2011. This review follows two previous reviews of soil handling and air quality information: Task 2989 and Task 3646.

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**TECHNICAL ANALYSIS:**

**ENVIRONMENTAL RESOURCE INFORMATION**

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

**SOILS RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

**Analysis:**

Section R645-301-222 describes a 27.6 acre planned disturbance for the mine facilities area. The area was surveyed by Bruce Chessler in 2006 and 2007. According to the soil survey map, Figure 1 in Exhibit 6, 68,000 cubic yards may be recovered from 27.4 acres on the east side of SR 96. Table 8 in Exhibit 6 outlines the volume of salvage by map unit. Maps 34 and 37 show the proposed disturbed area boundary and the area of soil salvage. There is an estimated 12,000 cubic yards of buried coal fines buried that will be removed during the salvage operation (Section 232.100, Essential Step #13). Map 45 illustrates the known locations of buried coal fines.

The Order I soil survey in Exhibit 6 includes field description of soil pits, laboratory analysis of samples taken by horizon, and a soil map (Figure 1). The soil survey classifies the soil into five map units: DA (0 – 20% slopes previously disturbed land); DB (20 – 50% slopes previously disturbed land); 2A (Typic Argixeroll-Typic Haploxeroll complex, 0 – 35% slopes); 1B (Typic Argicryoll Consociation (35-70% slopes); 2B Typic Argixeroll Consociation (35 – 70 % slopes). These map units are described and representative pedons are provided for each unit.

Exhibit 7, Vegetation Information, provides total living cover estimates for both the disturbed (40%) and undisturbed (64%) vegetation types. Table 25 provides an estimate of productivity for each range type.

Previously disturbed soil, topsoil and subsoil will be salvaged for use in reclamation, no borrow soils will be needed.

**Findings:**

The information provided meets the requirements for baseline soil survey information as required by the R645 Coal Rules.

## ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR 785.19; 30 CFR 822; R645-302-320.

### Analysis:

#### Alluvial Valley Floor Determination

The alluvial valley floor is discussed in Chapter 9 and shown on Map 32. The Permittee notes that the requirements of R645-302-321.100 pertain solely to surface coal mining and reclamation operations. However, the Rule heading, R645-302-320, clearly applies to both underground and surface coal mining operations.

*320. Alluvial Valley Floors. R645-302-320 applies to any person who conducts or intends to conduct coal mining and reclamation operations on areas or adjacent to areas designated as alluvial valley floors.*

As stated in the Application, the information is collected, because it is pertinent to the probable hydrologic impact of the underground mining operation.

The existence of an alluvial valley floor with irrigated pastures and areas of subirrigation along Mud Creek in Pleasant Valley below the Utah No. 2 Mine (now the reclaimed White Oak Load Out) was previously established by the Division (1984 Technical Analysis of the Valley Camp Mine, ACT/007/001, and Valley Camp MRP Map R645-301-411.100 Premining Land Use Map).

Regional Surface Geology Map 6, Regional Geology Map, illustrates Mud Creek flowing through alluvial sediments adjacent to the mine site permit area. Map 1A identifies many acres of pastureland between Hwy 96 and the railroad tracks. The proposed site is situated in an area that has been zoned agricultural (Map 4, Regional Land Use Map). Mine Surface Facilities Map 14 illustrates the location of an irrigation ditch on the proposed mine site. Although the irrigation ditch is not in use (Chapter 9, R645-302-322.100), cross section A-A' on Map 16 Mine Surface Facilities Area Cross Sections, shows the irrigation ditch will be culverted during mining and restored after mining, to preserve the conveyance for future use.

As illustrated on Map 32, the AVF follows Mud Creek to the Scofield Reservoir. The AVF is outside of the proposed permit boundary, west of SR 96. Map 32 outlines an AVF (alluvial deposits) and a "Quasi-AVF" area (with a potential for flood irrigation), the soil map

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units, the locations of the Scofield Ditch Company ditches, and provides a table of AVF acreage by landowner. Productivity estimates are given for the Silas soil map unit as cited in the 1988 NRCS publication, Carbon County Soil Survey. Silas Soil is a the main component of both Map Unit 108 and 109, along stream channels and in low lands. The silas soil is in the Mountain Meadow range site, with an expected annual productivity of 3,000 lbs/ac, with an estimated carrying capacity of 1 AUM/acre (Chap 9, Livestock capability). The Division has observed that the Jones and Smiths run a sizeable calf/cow operation (landowners for areas 1 – 9), but that the Hammond land (area 10, across the highway from the proposed mine site) is not presently in agricultural use.

A comment was received during the (2008) public comment period that adequate information was not available in the application to ensure protection of renewable resource lands. In accordance with R645-302-320, the application includes a description of the potential for agricultural activity for the predominant Silas Loam soil within the adjacent AVF. The application describes Scofield Ditch system as the source of irrigation for the adjacent lands. The East Branch ditch divides as shown on Map 32. The last successful use of the ditch was 25 years ago, according (Productivity discussion, Chap 9). The applicant has provided a map identifying the adjacent [agricultural] landowners, identifying subirrigated (AVF) and potentially irrigated (Quasi-AVF) lands, showing all irrigation ditches, and defining the extent of the adjacent alluvial valley floor in Pleasant Valley.

Map Unit 108, Map 32 does not extend north to take in the mouth of Miller Creek. The Applicant indicates that Miller Creek will be addressed during future expansion (Chapter 9, Discussion).

**Findings:**

The information provided meets the requirements of Alluvial Valley Floor identification immediately adjacent to the proposed permit area.

**PRIME FARMLAND**

Regulatory Reference: 30 CFR 785.16, 823; R645-301-221, -302-270.

**Analysis:**

The NRCS determined the land was not prime farmland (Exhibit 2). The Division concurs with the NRCS, due to the fact that the land has been historically used for mining (Map 5) and was reclaimed by the Division under the Scofield Abandoned Mine Reclamation project (AMR/007/904). Although the remnants of a diversion ditch exist within the permit area (Map 14), it likely served the surrounding agricultural land shown on Map 4.

## **Findings:**

The information provided meets the requirements for baseline soil survey information as required by the R645 Coal Rules.

# **OPERATION PLAN**

## **TOPSOIL AND SUBSOIL**

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

### **Analysis:**

#### **Topsoil Removal and Storage**

The proposed disturbed area is 27.6 acres and includes 0.4 acres across SR 96 from the main facilities. Total potential topsoil and yield is 68,845 yd<sup>3</sup> (Section 232.100 and Map 34).

Most of the soil (40,460 yd<sup>3</sup>) will come from 20 acres of previously disturbed lands, and most of the previously disturbed soil (38,859 yd<sup>3</sup>) comes from Map Units DA-3, DB-2, DB-4, and DB-5. Based upon the soil survey, the plan calls for soil removal from 1.2 feet up to a depth of three feet (Map 37). Topsoil and subsoil from undisturbed slopes will contribute 27,396 cubic yards from 6.94 acres (Map Units 1B, 2A, and 2B) to the stockpile. However, steep areas will not have topsoil salvaged and approximately 13,879 yd of topsoil from steep areas will be mixed with the fill (Section 232.100). Map 37 demarcates the topsoil salvage boundary along those areas considered too steep (> 30%) for soil salvage. Map 33 illustrates the slopes within the proposed disturbance and itemizes 7.37 acres or 29.47% of the permit area as unavailable for soil salvage due to slope.

Section 232.100 describes salvage of soil from avoidance of buried coal and separation of coal fines from salvaged soil, if the buried coal is greater than six inches deep. Map 45 provides information on the location and volume of the estimated 12,000 yd<sup>3</sup> of coal fines buried in within the disturbed area.

A qualified reclamation specialist/soil scientist will be on site to direct the soil salvage, which is complicated by areas of previously disturbed and pockets of buried coal. The applicant commits to reporting final salvage volumes in an annual report (R645-301-232.100).

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The salvaged soil will be stored in three locations as described on Map 38, Topsoil Storage. Topsoil storage locations are also shown on Map 13, Surface Facilities. Two stockpiles west of the SR 96 will hold approximately 2,000 yd<sup>3</sup>. East of SR 96, the largest stockpile will be layered against the bathhouse parking lot fill. The soil will be protected by a ditch, a berm and by a six foot excavated material base that will raise the level of the topsoil pile above the expected level of road salt accumulation. Pile construction is illustrated on Plate 38. This stockpile has the capacity for approximately 20,000 topsoil storage that will be constructed in a trapezoidal shape against the existing slope and against a fill slope. The topsoil stockpile will be approximately 20 ft. in depth with an outslope of approximately 4h:1v (as shown in cross Section A-A' on Map 16). Berms and ditches will protect the large stockpile from water erosion, described in Section 234.220 and 234.230. The topsoil stockpile sediment control plan is illustrated on Map 24. Surface roughening and a temporary seed mixture of wheatgrasses, bluegrass and Utah Sweetvetch (Table 21) will also provide erosion protection on the stockpile outslope.

**Findings:**

The information provided in the application meets the requirements of the R645 Coal Rules for Soils Handling Operation Plan.

**HYDROLOGIC INFORMATION**

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

**Analysis:**

**General**

**Acid- and Toxic-Forming Materials and Underground Development Waste**

Tables 4 and 4A in Section R645-301-624 present the results of acid/toxic analysis on six cores within the proposed lease area and on mine waste buried within the proposed disturbed area boundary. Exhibit 19 in Volume 4 presents the details of the core analysis which was performed by SGS Labs, Denver. Exhibit 6 presents the details of the mine waste analysis, also performed by SGS Labs.

The information provided suggests that the roof and floor is potentially acid forming. The roof and floor may be blended with the coal product, or it may be placed temporarily in the

Temporary Stockpile shown on Map 13, Surface Facilities, or it may be temporarily stored in the "off-spec" stacking tube for eventual shipping. The MRP states that any unused material stored in the Temporary stockpile will be taken under contract with a third party to a processing facility. The plan states that confirmation of such a contract will be provided as soon as it is finalized. Receipt of this confirmation should be a condition of permit issuance. (See also engineering review deficiency R645-301-536.510.)

Section 528.320 states that the maximum time the temporary waste pile will remain on the surface is two years. Section 515.300 of the MRP states that during periods of temporary cessation lasting 30 days or more, one composite waste sample will be drawn for every 5,000 Tons in the pile to be analyzed according to Tables 3 & 7 of the 2008 Division Topsoil and Overburden guidelines.

Section 542.200 Backfilling and Grading to Establish Final Configuration states that the all coal seams and any coal mine materials or coaly materials will be covered with four feet of suitable soil (Priority #1). Section 553.250 Refuse Pile & 553.260 Disposal of Coal Processing Waste states that coal mine waste encountered during reclamation will be covered with four feet of suitable material and Section 553.300 provides a commitment to backfill the coal seam with four feet of cover.

### **Findings:**

The information provided meets the requirements of the Utah Coal Rules.

## **RECLAMATION PLAN**

### **TOPSOIL AND SUBSOIL**

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

### **Analysis:**

#### **Redistribution**

Operational contours are shown on Surface Facilities Map 13. Cuts made into competent sandstone may approach 0.8h:1v (Exhibit 14). Reclamation slopes will vary from 5h:1v to 0.5h:1v (Section 542.200, Backfilling and Grading to Establish Final Configuration). Exhibit 14, RB&G Engineering November 2007 Report, discusses the stability of reclamation fill slopes ranging from 1.4H:1V to 2H:1V. RB&G specifies that clayey fill slopes (Sections A-A, B-B,

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and F-F) constructed at 1.5h:1v will have a safety factor of 1.3 and that the silty sand fill (Sections C-C, D-D, and E-E) could achieve a safety factor of 1.3 at slopes of 1.8h:1v. Map 29 shows reclamation contours. Map 33 identifies the locations of steep slope reclamation areas and will be used to determine reclamation treatment as discussed in Section 542.200 Soil/Substitute Replacement.

The final reclamation contours are shown on Map 29, Post Mining Topography. Cross sections of the post mining topography are shown on Maps 16 through 19; cross-section locations are shown on Map 13, Surface Facilities.

Tractor scrapers or wheel loaders and trucks will be used to recover material stored in the stockpile and transport the material to the graded slopes. A uniform thickness of 14.8 inches will be replaced on the graded surface. Soil replacement thickness will be monitored (Section R645-301-242). After soil placement, soils will be sampled and analyzed, with 1 sample taken per four acres (Section R645-301-243). Samples will be analyzed for suitability parameters described in the Utah Guidelines for Topsoil and Overburden.

Regraded slopes of less than 30% will be deep ripped. Slopes of greater than 30% will be roughened with a track hoe. Refer to Map 33 for slope steepness. All regraded slopes will be amended with 3 Tons/ac chopped hay (Section R645-301-243). Further fertility amendments will be dependent upon the results of the laboratory analysis. Seeding will occur immediately after topsoil placement (Section R645-301-244.200, Soil Stabilization).

Sections R645-301-244.200 and R635-301-340 Soil Replacement and R645-301-355 describe the application of an additional 2.0 tons/acre straw or hay after seeding, followed by crimping.

**Findings:**

The information provided in the application meets the requirements of the R645 Coal Rules for Soils Redistribution Plan.

**CONTEMPORANEOUS RECLAMATION**

Regulatory Reference: 30 CFR Sec. 785.18, 817.100; R645-301-352, -301-553, -302-280, -302-281, -302-282, -302-283, -302-284.

**Analysis:**

**General**

Section R645-301-352 describes contemporaneous reclamation practices for exploration activity.

**Findings:**

Information provided meets the requirements of the Coal Rules.

**STABILIZATION OF SURFACE AREAS**

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

**Analysis:**

Stockpiled topsoil and subsoil will be bermed and seeded. The stockpile will cover 2.1 acres (Section 231.400).

Section R645-301-331 describes interim reclamation of roadcuts, ditches, sedimentation pond embankments, soil stockpiles to control erosion. Section R645-201[sic]-527 emphasizes all road cut and fill slopes and excavated slopes will be stabilized with an interim vegetation mix.

Road PR-1 will be paved from Hwy 96 to the shop/warehouse (Section R645-201[sic]-527). Other roads will be watered or be treated with dust suppressants and a 15 mph speed limit will be imposed in accordance with the air quality permit dated December 11, 2008 (Exhibit 4).

Final reclaimed areas will be ripped or gouged, seeded and top dressed with 2 tons/acre straw crimped into the soil (Section R645-301-340 Soil Replacement and Seedbed Preparation and Section R645-301-355). Section 412.100 states the post mining land use is wildlife, watershed, and commercial. A commitment for the treatment of rills and gullies is found in Section 244.300.

**Findings:**

The information provided in the application meets the requirements of the R645 Coal Rules for Soil Stabilization.

**RECOMMENDATIONS:**

The application is recommended for approval.