September 16, 2003

TO: Internal File

THRU: Pamela Grubaugh-Littig, Permit Supervisor

FROM: Jerriann Ernstsen, Environmental Specialist/Biology, Ph.D.

RE: Technical Field Visit, Revegetation Projects and the Disturbed 1.4-Acre Site, Consolidation Coal Company, Emery Deep Mine, C/015/015

Other Attendees: DOGM: Steve Fluke
NRCS: Jim Brown and Larry Ellicott (Roosevelt), and Dan Ogle (Boise);
CCC – Tim Kirschbaum and Patrick Collins.

Date & Time: July 22, 2003, morning and early afternoon.

PURPOSE:

The Division biologist, NRCS plant and habitat specialists, and Patrick Collins (mine botany consultant) visited Emery Deep mine on July 22, 2003. The primary goal was to examine vegetation of certain reference and revegetated areas at the mine site. In the past, Emery Deep has had difficulty in successfully revegetating disturbed sites. Therefore, one of the conditions to the permitting the 4th east portal was to show reclaimability. Emery Deep agreed to follow a four-phase evaluation and implementation reclaimability project. NRCS offered to visit Emery Deep, evaluate current vegetation, and submit plant species recommendations to Emery Deep and the Division for the reclaimability and future revegetation projects.

The second goal of the Division was to examine the 1.42-acre disturbed site at the 4th east portal.

IN THE OFFICE:

All participants met in the Emery Deep office to discuss existing seed lists and planting strategies. Below is a list of subjects and participant comments.

Warm and cool season species:

The Division is attempting to test summertime planting during the *monsoon* season. Seed mixes will have both warm and cool season species that are physiologically different plant types. The goal is to provide warm season species a chance to germinate and grow during the hot summer monsoon season while cool season species remain dormant.

It was previously suggested to seed the two plant types at different times in order to provide the warm season species a "head start". However, the two plant types thrive under different environmental conditions; therefore, the Division biologist believes there is no reason to seed the two at different times. The cost of seeding at two different times may also be cost prohibitive.

Summertime seeding of both species may provide positive results for Utah if there are areas that are hot and receive predictable precipitation events. This seeding procedure is successful for the Peabody Coal Company in New Mexico, but they receive around 70% of its precipitation during the monsoon season (Vern Pfennsenstiel, personal contact 5/14/03). The Division biologist highly questions that Utah has similar environmental conditions to New Mexico. Usually areas that receive predictable summertime precipitation are higher in elevation with lower temperature highs and lows. The lower temperatures would result in the cool season species germinating along with warm season. The cool season species, therefore, may have the temperature-related competitive edge over the warm season species.

Unfortunately, Emery Deep mine is in an area that NRCS believes has summertime precipitation events that are too unpredictable. NRCS recommends that Emery Deep mine plant during the fall and spring months. Furthermore, that springtime planting should only occur if the Permittee could guarantee reliable irrigation. The Division recommends fall over spring seeding.

The seed mix could have both plant types, but the cool season species may out compete the warm season species. If the Permittee decides to include warm season species, the Division recommends selecting one of the more hardy warm season species. The Division usually recommends natives, but Curly Mesquite (*Hilaria belangeri*; NM, AZ, TX) may provide a competitive edge to weeds, drought, and cool season species.

Another recommendation is to seed both types at the same time, but with two separate passes. Seed the cool season species during the first pass, lightly rake the site, then seed the warm season species during a second pass. This double pass may provide the warm season species with optimal shallow seeding depth.

Native Hay:

Peabody Coal Company suggests using "native" hay as a soil amendment and selecting

hay imported from Oregon, Kentucky, Nebraska. Their native hays such as Little Bigblue and Kentucky Bluegrass are about 160.00/ton, high lignin content, and high water users. The high lignin content allows the hay to hold up to crimping and last longer than straw or barley hay. This longer lasting hay outweighs the cost of shipping. The high water requirement prevents germination of unwanted seed.

NRCS states that for the Emery Deep mine with very low precipitation rates, local hays may work just fine. They reason that even if the hay contains high amount of barley or oat seed, the seed probably will not germinate because of low water availability. NRCS recommends applying salina wildrye hay. The Permittee may want to test persistence among different hay types.

The group also discussed different mulch types. NRCS recommends using grass hay as mulch, while Patrick Collins suggest using Biosol. The Biosol product contains NPK fertilizers at a ratio of 6-3-1. The Division cautions the Permittee using Biosol because fertilizers are usually not recommended for most projects by many reclamationists (DOGM, OSM, Peabody Coal Company). Fertilizers seem to provide introduced, weedy species a competitive edge over native species in seed mixes. NRCS does not recommend using wood chips because it ties up water and nitrogen more than straw or hay.

FIELD OBSERVATIONS: SEE IMAGES 07222003 IN DATABASE.

REFERENCE AREAS

The goal to visit the following reference areas was to allow NRCS to determine dominant species present and plant cover.

Greasewood:

This reference area is directly west of the loadout near the main office. Observations for this area include:

- Approximately 25-35% cover.
- Cryptogams present.
- Silt deposits with overland saline flow.
- Water piping of surface.

This reference area was originally intended as a reference area for a proposed slurry pile. We observed this greasewood community because of proximity to the office and time constraints. This area has a mancos shale soil type that is susceptible to piping. Water flows over the surface, penetrates the surface near plant roots, erodes areas around the roots, and eventually forms channels and surface depressions. It is difficult for salts to penetrate the mancos shale surface; therefore, the soil surface has some salt residue (NRCS comments).

Mixed desert shrub:

This reference area is about 200' north of the new county road leading to the 4th east portal and about 1-2 miles from the main office. Observations for this area include:

- Fenced.
- Approximately 30-35% cover.
- General plant species present: Indian ricegrass, galleta, winterfat, black sagebrush, shadscale, hook cactus, buckwheat, broom snakeweed, blue grama (1 individual), squirreltail, ring muhly, alkali sacaton.

In February 2003, NRCS accompanied the Division on a site visit to the mixed desert shrub reference area. At that time, NRCS estimated this site as 15% cover.

REVEGETATED AREAS

The goal to visit the following disturbed or revegetated areas was to allow NRCS to determine dominant species present and plant cover.

Subsoil stockpile

This revegetated site is northeast from the main coal stockpile and north of the new county road. Observations for this area include:

- Approximately 10-15% cover.
- General plant species present: fourwing saltbush, greasewood, western wheatgrass, pipe plant.

Topsoil stockpile

This revegetated site is northeast from the main coal stockpile and south of the new county road. Observations for this area include:

- Approximately 5% cover.
- General plant species present: sulfur buckwheat, pygmy sagebrush.

Proposed reclamation site

This disturbed site is within the main mine area near the office. This pad area is flanked by a high natural rock wall on one side and Christiansen wash on the other. Observations for this area include:

- General plant species present: Indian ricegrass, cheatgrass, fourwing saltbush, rabbitbrush, riparian species along the channel.

NRCS recommends to only reclaim/revegetate the road and building pad area. They do not recommend pushing and building up soil along the rock wall and blending the slope to the stream channel. NRCS reasons that the area is too narrow for such regrading and that water dropping from the cliff to the pad below would cause significant soil erosion. NRCS recommends to rip, topsoil, gouge, and seed the road and building pad area.

4th EAST PORTAL

The second goal of the Division was to examine the 1.42-acre disturbed site at the 4th east portal. In the morning, on our way to the office, the Division noted a large plume of black dust coming from the 4th east portal area. The Division did not realize the source at that time. We finally arrived at the site early that afternoon and realized the source of the black plume.

Disturbed 1.42 acre site

There were no coal mining operations that day because employees were off for the holiday break. There was a coal vacuuming truck and two workers at the disturbed 1.42-acre site. The workers were finished for the day, but mentioned that they had been at the 4th east portal site for the last two weeks. They had been vacuuming coal fines within the permit area the previous week and within the disturbed 1.42-acre site (east of the permit area) for that week.

Visual results of the areas vacuumed of the 1.42-acre site include:

- Site still has coal fines lightly covering the surface, but without measurable depth.
- Mining operations and clean up are disturbing the native plants.
- Truck(s) had created a half-oblong shaped-road from the unimproved county road to the permit fenceline.
- Disturbed soil is very powdery and may be susceptible to water and wind erosion.
- Permittee removed the “wind sail” that had been installed along the eastern fenceline and previously blown off.
- Coal fines in areas where the workers had not vacuumed, yet, are crusted in thick platelets.

The Division believes that the general condition of the site is now extremely disturbed and fragile. Clean up attempts to address the NOV written in January 2003 may have resulted in disturbing the site more than if it had been left alone (i.e. without continued buildup of coal fines).

Archeology site

The site is well marked. Tim Kirschbaum stated that he thought the archeologist fenced the site. Tim did not know who tied all the fluorescent ribboning on the fence. The Division believes that this site has been marked to such a degree that it draws attention to itself. The Division plans to contact SHPO to see if this level of protection is warranted.

Topsoil stockpile

The Permittee seeded the topsoil pile in the fall 2002. Seed germination and plant growth looks very successful at this time.

The Permittee has cleaned up much of the mining operation debris collected along the western road edge. This debris had been noted during the February 2003 site visit.

RECOMMENDATIONS/CONCLUSIONS:

It has been recommended for Emery Deep to do the following:

- Seed during the fall and spring months, with preference during fall seeding.
- Seed during springtime only if the Permittee guarantees reliable irrigation.
- Incorporate both warm and cool species in the seed mix.
- Seed warm and cool season species at same time or in two separate passes.
- Select hays that hold up to crimping and weathering.
- Select mulch that does not tie up water and nitrogen, such as grass hay or straw.
- Seed mancos shale areas when precipitation is guaranteed.

For the proposed site:

- Reclaim only the road and building pad area.
- Rip, topsoil, gouge, and seed the road and building pad area.