



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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February 9, 1999

TO: Pamela Grubaugh-Littig, Permit Supervisor *PL*

THRU: Joe Helfrich, Permit Supervisor *JH*

FROM: Robert Davidson, Senior Reclamation Specialist *RAD*

RE: Topsoil, Phase I Bond Release for the Old Cottonwood/Wilberg Waste Rock Site, PacifiCorp, Cottonwood/ Wilberg Mine, ACT/015/019-BR98-1, File #2, Emery County, Utah

SUMMARY:

In a letter dated December 17, 1998, Energy West requested Phase I bond release for the Old Cottonwood/Wilberg waste rock site. The site is located alongside Highway 57 and is 1.8 miles from the Cottonwood Mine (Township 17 S Range 7 E Section 34, NE1/4 SE1/4).

Analysis:

The Old Cottonwood/Wilberg waste rock site is located alongside Highway 57 and is 1.8 miles from the Cottonwood Mine (Township 17 S Range 7 E Section 34, NE1/4 SE1/4). The waste rock site consists of seven cells. Waste rock was placed in the first cell in 1983 and the last cell was reclaimed in 1993.

On October 14, 1998, Robert Davidson and Dennis Oakley visited the site. The site was observed from the northwest corner of the site, standing on top of the rock storage pile. The best vegetation was observed on the berms. Cells 1, 2, 6, and 3 appeared to have better vegetation establishment when compared to cells 5, 4 and 7. Cell 7 has the least amount of vegetation establishment. Discussion focused on soil quality for supporting vegetation in terms of salinity and SAR (Sodium Adsorption Ratio). Visual observation seems to indicate that in areas where salts were allowed to leach, vegetation establishment is the best (e.g., berms, upper drainage areas, etc.).

The Permittee seeks to have Phase I bond release on 15± acres at the Old Cottonwood/Wilberg waste rock site. Bond release for PHASE I may be considered only after the Division is satisfied that all the reclamation requirements for PHASE I have been met. The requirements for PHASE I reclamation are completion of backfilling and regrading (**which may include the replacement of topsoil**); and, completion of drainage control in accordance with the requirements of the approved reclamation plan.

General requirements for backfilling and grading, which may include topsoil replacement, include the following (**note: topsoil related issues are bolded text**):

- A map illustrating the "as-built" topography if different than the most recently approved plan.
- Pre- and Post-mining Contour Topographic Maps (no smaller than 1"=500') showing:
 - a. Permit Area
 - b. Areas Previously Released
 - c. Areas Proposed for Release
 - d. Post-mining Topography
 - e. Post-mining Hydrologic Features, including drainage, ponds, and monitoring sites
 - f. Cross-sections, including but not limited to, Approximate Original Contour (AOC), drainage systems, ponds, roads, etc.
 - g. Dates of Backfilling and Grading Activities
 - h. Dates of Topsoil Replacement
 - i. **Topsoil Replacement Depths**
- Results of overburden chemical analysis with discussion on how overburden will not adversely affect plant growth or water quality.
- Evaluation of **topsoil or substitute soil** including analyses and **replacement depths**.
- Evaluation of **subsoil** including analyses and **replacement depths**.
- Any field designs, modifications or changes to the mining and reclamation plan which occurred in conjunction with the reclamation activities.
- A brief history of mining and reclamation activities indicating when mining operations began and ended, when earthwork and topsoil distribution began and ended.

In the letter dated December 17, 1998 from Energy West the Permittee has recorded the dates when each of the cells were reclaimed, and the number of monitoring years as follows:

1. Cell 1, seeded in 1983, monitored - 13 years
2. Cell 2, seeded in 1984, monitored - 12 years
3. Cell 3, seeded in 1985, monitored - 11 years
4. Cell 4, seeded in 1986, monitored - 10 years
5. Cell 5, seeded in 1989, reseeded in 1993, monitored - 4 years
6. Cell 6, seeded in 1989, reseeded in 1993, monitored -4 years

7. Cell 7, seeded in 1993, monitored - 4 years.

The letter explains that as the cells were filled to their capacity, they were backfilled and graded as outlined in the MRP. Sufficient subsoil material was used to cover the waste rock along with 12" of topsoil. Furthermore, the letter states that the depth of total soil cover varies throughout the waste rock site. No further information is added in the letter or the accompanying application as to soil volumes and soil replacement depths. *Since the application indicates that soil cover varies throughout the site, the above information is inconclusive at best and does not allow the Division to make a finding on soil replacement depths as they actually occurred or currently exist.*

The December 17, 1998 letter states that enough soil material was stock piled for the construction of a berm around the cell with the berm providing enough backfilling and cover for each cell as they were completed. The Division therefore assumes that soil was obtained from the berms. No further information is provided to show the amounts of soil stock piled in the berms or the volumes of soil used to reclaim each site. *Cross sections are provided showing original, excavated and final surface configurations, but do not indicate volumes. Engineering calculations and records should provide information needed to calculate and report the depths and volumes of soil excavated for use during reclamation. Excavated volumes should be based on acreage and depth of excavation; likewise, replacement volumes need to be based on replacement depths and acreage.*

The application includes discussion and information concerning soil sampling and analysis. Analyses include pH, EC, Ca, Mg, Na, SAR, Se, and B. An excellent summary for analyses is given both in the letter and application, with comparison charts for each cell comparing soil characteristics between 1986 and 1994 sampling periods. *However, in order to correlate analyses with soil replacement quality, the depth of soil replacement is needed to help rectify if analyses are for topsoil, subsoil, substitute topsoil, overburden, or refuse.*

A general statement in the letter is given for soil classification within the waste rock site. Soils range from a sandy loam type on the northern end of the site to sandy clay loam/loam type on the southern most end of the site. No further information is given for actual soil types by depth within each sampling location and cell. *Sampling depth increments are stated and shown for each set of analyses, but soil texture and type of material are not given which would help identify soil replacement depth and whether the material was soil or refuse.*

Finding:

The permittee must provide the following, prior to approval, in accordance with the requirements of:

R645-301-880.320, R645-301-120, and R645-301-250, Since the application indicates that soil cover varies throughout the site, information provided in the application

is inconclusive and does not allow the Division to make a finding on soil replacement volumes and depths as they actually occurred or currently exist:

- Engineering calculations and records should provide information needed to calculate and report the depths and volumes of soil excavated for use during reclamation. Excavated volumes need to be based on acreage and depth of excavation; likewise, replacement volumes need to be based on replacement depths and acreage.
- Soil texture and type of material need to be provided for each sampling depth increment for identifying soil replacement depth and whether the material was soil or refuse.