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State of Utah

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DIVISION OF OIL, GAS AND MINING

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DIVISION OF OIL GAS & MINING FIELD VISIT FORM TECHNICAL

Date : April 15, 1997

Mine: Cottonwood/Wilberg Mine

File Number: ACT/015/019

DOGM Staff: Robert Davidson, Sharon Falvey, Daron Haddock, Jesse Kelley, William Malencik, and Susan White.

Other Attendees: PACIFICORP: John Christensen, Richard Jensen, Dick Northup, Chuck Semborski, and Bob Willey. EMERY COUNTY: Ray Petersen.

Purpose:

- Midterm Review - Determination of Reclamation Plan Inadequacies for Cottonwood Canyon fan portal site.

Observations:

- GENERAL. The Cottonwood Fan Portal area was disturbed circa 1980, although a portal or fan was never installed. Current reclamation plans call for backfilling the coal seam only and leaving much of the removed soil and fill in its present location since it is stable and well vegetated. The existing reclamation plan may not achieve reclamation success, since it does not provide for achieving AOC (Approximate Original Contour) nor does it provide for adequate reestablishment of vegetation.
- SOILS. Both the topsoil and subsoil stockpiles are covered by aspen/fiber, erosion control matting. Further protection from soil loss is provided by soil berms and installation of silt fences. There are some minor surface failures with soil slumping on the steeper faces of the stockpiles; the eroded soil was contained inside the berms. Currently, there is little vegetation establishment on the stockpiles since they were recently disturbed and relocated last year during installation of the conveyor system linking the Cottonwood Canyon area to the Wilberg mine. The larger rocks and boulders recovered during soil salvage are currently stored at the old Wilberg Mine waste rock storage site.
- ENGINEERING. This site lies immediately adjacent to Utah State Highway 39 on the east side of Cottonwood Canyon, a tributary of Straight Canyon. Though the site is directly opposite the Trail Mountain mine, it is part of the Cottonwood/Wilberg mine permit area.

The permittee established the site in 1980 with the intent of placing a mine fan and other surface facilities there. However, this plan was later abandoned and so the site was never developed. The site now consists of a large area from which the topsoil and subsoil material have been removed; this material was stockpiled at the west side of the site, along the state highway.

The site is approximately 800 feet long, from north to south, 450 feet wide, from east to west, and 280 feet high, from the state highway to the top. There are 2 main benches that run the entire length of the site: the coal seam bench and the upper bench. The coal seam bench starts about 110 feet above the state highway and is 35 feet high. The upper bench is immediately above the coal seam bench and is also 35 feet high. There are also several smaller benches, mostly in the northeast quarter of the site above the upper bench. A diversion ditch runs above the site from north to south for its entire length and then abruptly turns to the west and empties into a natural sandstone drainage. The overall slope of the site is about 1.5h:1v (34°).

- **HYDROLOGY.** The existing plan provides for the upper diversion to be redirected over the slope via transverse ditches across the diversion. Discussions of what to do with the diversion varied from leaving the existing diversion to creating a second diversion over the slope to decrease the watershed area diverted to this ditch. Although the existing ditch has functioned adequately above the cut area over its 17-year life, some instability is present below the cut area at the top of the receiving area drainage.

There are some wet seep areas along the benches. The seeps have the potential to provide detrimental or positive effects on the reclamation. Where the seeps are present and the sand stone ledge does not have adequate width to support back fill instability could result. Where the ledge has adequate width, care in placing the fill could result in a quick desirable establishment of vegetation because of the availability of moisture.

- **VEGETATION.** The lower portion of the disturbed area was reclaimed in the early 1980's. It appears that most of the material cut from the slopes above was deposited in this area. Past conversations with the operator and Division staff have reported that irrigation was used to establish vegetation. Good vegetative cover and shrub density and fair species diversity was observed.

Poor vegetation cover was observed on the cut slopes and benches.

- **HISTORIC RESOURCES.** The old Johnson Mine site was observed to the north of the fan portal site. The two portals associated with the site were observed along the upper access road. The portals had been sealed.

Recommendations/Conclusions:

- **GENERAL.** Following the existing reclamation plan will most likely not achieve reclamation success. The following main areas of the reclamation plan should be improved before attempting reclamation at the site.
 1. Achieving AOC through the elimination of highwalls and by backfilling and grading using all reasonably available spoil materials.
 2. Establishing vegetation through better and more extensive use of the available soil resources.
 3. Delineating drainage channels which will be used during the various phases of reclamation and which will control runoff so as to not cause erosion.
- **SOILS.** The salvaged rock and boulders currently being stored at the Wilberg waste rock site should be used in conjunction with the soils and fills to help reclaim the fan portal area. In addition to using the salvaged topsoil and subsoil, the well-vegetated downcast material below the cut slopes and highwall should be used as substitute topsoils and fills during reclamation. The cut slope and resulting bench areas need to be tested for toxic/acid forming characteristics since these areas currently support little to no vegetation.
- **ENGINEERING.** Preliminary calculations, using the stability parameters found in the plan, indicate that completely backfilling the site is out of the question. In order to achieve the static stability safety factor of 1.5 required by the Utah regulations, a backfill extending from the coal seam bench to the top of the site could not be steeper than about 2h:1v and a backfill extending all the way from the level of the state highway to the top of the site could not be steeper than about 4h:1v, even assuming completely dry conditions. Moreover, the rock strata, exposures of which are quite broad below the coal seam bench, slope away from the hillside, which would further jeopardize the stability of any total backfill of the site.

The permittee should completely backfill the coal seam bench and the upper bench and the smaller benches in the northeast quarter of the site and establish a good vegetative cover on these backfilled areas. While this would not restore the ground surface of the site to its original elevation, it would visually blend the site into the surrounding area, which has many ledges and sparsely-vegetated talus slopes, and also restore the approximate original contour.

The permittee should consider leaving the upper diversion in place (it appears to have been stable over its 17-year life) and extend it southward to where it would empty directly into the natural sandstone drainage which lies just south of the site. While this would involve a slight enlargement of the disturbed area, it would certainly pay off by eliminating the steep and potentially unstable stretch of the ditch which goes from where it turns to the west to where it now empties into the natural sandstone drainage.

Cottonwood/Wilberg Mine

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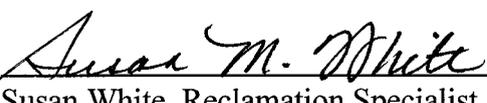
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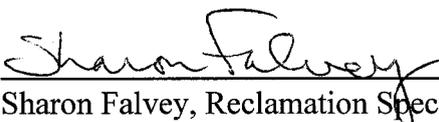
- **HYDROLOGY.** The permittee should consider stability and backfill designs when determining what drainage configuration will minimize the potential for instability of the site. Where possible it is recommended that as little fill as possible be placed in drainages because of the steepness of the cut slopes at this site. It is also recommended that naturally existing bedrock or sandstone ledges be used as the grade control for the channel configuration where possible.

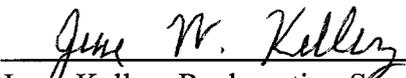
The permittee should assess and identify the seep areas. Where these seeps are present and there is an absence of ledge rock, backfill should be minimized to decrease the potential for instability. In areas where seeps are present and ledge rock allows backfill, there is a potential to increase vegetation success due to an increased availability of water.

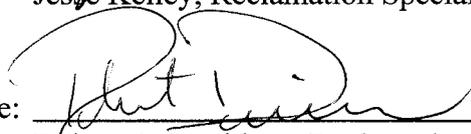
- **VEGETATION.** The lower revegetated portion of the site may be redisturbed to retrieve fill material. While it would be nice if this area were not redisturbed, there is no reason to believe that vegetation could not be reestablished if disturbance is necessary. If the area is redisturbed the surface soil material should be salvaged.
- **HISTORIC RESOURCES.** A protection plan should be developed for the site. The operator should document the current conditions of the historic Johnson Mine site.

Signature:  on May 1, 1997
Daron Haddock, Permit Supervisor

Signature:  on May 1, 1997
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