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TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

May 19, 2011

TO: Internal File

THRU: Jim Smith, Permit Supervisor, Lead *JS 06/06/11*

FROM: Ingrid Campbell, Environmental Scientist II *IC*

RE: Phase II and III Bond Release 9th East Portal Area, PacifiCorp, Deer Creek Mine, Permit C/015/0018 and Task #3726

SUMMARY:

On January 11, 2011 the Division received an application from PacifiCorp for Phase II and III Bond release of the Deer Creek Mine 9th east portal area. The information provided for phase II bond release includes a vegetation analysis for the last two years of responsibility and a Demonstration that the area is not contributing suspended solids outside the permit area. PacifiCorp also included information for phase III bond release which includes a demonstration that the responsibility period has been met and a demonstration that the post mining land use has been achieved.

The phase II and III bond release for the Deer Creek 9th East Portal Area is recommended for approval.

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TECHNICAL ANALYSIS:

RECLAMATION PLAN

POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

Analysis:

Attachment 11 of the bond release application includes a demonstration that the post mining land use has been achieved. The land use of the cottonwood- wilberg mine was established as grazing and wildlife.

R645-301-356.230 states that “for areas to be developed for fish and wildlife habitat...success of vegetation will be determined on the basis of tree and shrub stocking and vegetative ground cover.” The woody plant density of the reclaimed area exceeds the reference area by approximately 375%.

R645-301-356.231 states that “minimum stocking and planting arrangements will be specified by the Division on the basis of local and regional conditions and after consultation with and approval by Utah agencies responsible for the administration of forestry and wildlife programs...” The Division approved the pinyon-juniper reference area for the cottonwood wilberg mine during permit issuance. The reference area was used as a measure of cover and woody species stocking, and the reclaimed portal area exceeds the reference area in all parameters.

R645-301-356.232 states that “trees and shrubs that will be used in determining the success of stocking and the adequacy of plant arrangement will have utility for the approved postmining land use.” Trees and shrubs planted at the reclaimed portal site include big sagebrush (*Artemisia tridentate var. wyomingensis*), curleaf mahogany (*Cercodarus ledifolus*), Fourwing saltbush (*Atriplex canescens*), Saskatoon serviceberry (*Amelanchier alnifolia*), and Whitestem rubber rabbitbrush (*Chrysothamnus nauseosus*). This tree and shrub planting list was approved by the Division during the initial permit application. All of these species have utility for the postmining land use of grazing and wildlife by providing either food or cover. “at the time of bond release, such trees and shrubs will be healthy and at least 80 percent will have been in place for at least 60 percent of the applicable minimum period of responsibility. No trees and shrubs in place for less than two growing seasons will be counted in determining

stocking adequacy.” The portal site was not replanted after the initial planting in 1999. Therefore, 100% of the planted trees have been on the site for the entire responsibility period.

Findings:

The information provided is considered adequate to meet the minimum regulatory requirements for this section

REVEGETATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:

Revegetation: General Requirements

Attachment 5 of the application includes the Reclamation treatments utilized at the Deer Creek Mine, 9th East Portal Breakout area. According to attachment 5, the breakouts area located on an east facing steep slope in the right fork of Grimes Wash. The area is dominated by rock outcrop, rubble land, and shallow soils. The site was originally disturbed prior to 1922. A total of approximately .6 acres were reclaimed, including the portal terrace area and access road. After sealing of the portals and backfilling was complete, certified weed free alfalfa hay was incorporated into the soil at a rate of 2000lbs/acre, and fertilizer Ammonium Nitrate and Triple Superphosphate were applied at 40 lbs/acre and 35 lbs/ acre respectively. The seed mixture (listed in attachment 5) was hand broadcast and wood fiber mulch was applied over the seeded area.

A description of the following was included in attachment 5 of the application pursuant to R645-301-341.200:

- Species and amounts per acre of seeds
- Methods to be used in planting and seeding. (the seed was hand broadcast)
- Mulching techniques (Wood fiber mulch was applied with tackifier)
- Irrigation (none was used)
- Measures proposed to be used for the success of vegetation

Revegetation: Standards For Success

The bond release application includes Year 1 and 2 final vegetation monitoring located in Attachment 8. The two year consecutive monitoring was conducted in 2008 and 2009 by Dr.

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Patrick Collins of Mt. Nebo Scientific. Dr. Collins monitored the vegetation of both the reclaimed areas and the reference area by gathering cover, frequency and composition data, woody plant density and production. Dr. Collins also calculated sample adequacy and diversity indices.

Dr. Collins found that the reclaimed area was dominated by sagebrush, pacific aster, fourwing saltbush, and thickspike wheatgrass. The total living cover of the reclaimed area in 2008 was estimated at 47.5% and 48.38% in 2009. Woody species density was estimated at 4154 plants per acre and 3,872 plants per acre in 2008 and 2009 respectively. Productivity was estimated at 407.84 pounds per acre and 1026.54 pounds per acre in 2008 and 2009 respectively.

The reference area was chosen during the initial permitting process and consists of a pinyon-juniper community. The total living cover of the reference area was estimated at 33% and 30.83% in 2008 and 2009. Woody species density was estimated at 1,106 plants per acre and 742 plants per acre in 2008 and 2009 respectively. Annual biomass production was estimated at 302.02 pounds per acre and 341.49 pounds per acre in 2008 and 2009.

Results from both years suggest that the reclaimed 9th East Portal Area exceeds the revegetation standards set by the reference area. All parameters were significantly higher than the reference area. Also, several indices showed that the reclaimed area was more diverse than the reference area in both years. Photographs of the reference and reclaimed areas were included in the reports.

Attachment 10 of the bond release application includes a demonstration that the responsibility period has been met. In accordance with R645-301-357.100-220,

- there has been no augmented seeding at the 9th east portal breakouts,
- weather data has been collected since 1980 and shows that the site receives less than 25 inches of annual rainfall. The responsibility period, therefore, is 10 years.
- The pinyon juniper reference area was used as the standard of vegetation success, and the reclaimed area, for the last two years of the responsibility period, exceeded the vegetation at the reference area.

On May 17, 2011, the Division conducted a site visit to the 9th East portal area. The site was stable and well-vegetated. See Inspection report for more details.

Findings:

The information provided is considered adequate to meet the minimum regulatory requirements for this section.

RECOMMENDATIONS:

The Deer Creek 9th East Portal phase II and III bond release is recommended for approval.

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