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# TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

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June 25, 2013

TO: Internal File

THRU: Steve Christensen, Permit Supervisor, Team Lead *SIC*

FROM: Priscilla Burton, CPSSc, Environmental Scientist III *PWB/mjs*

RE: Mid Term Review, Consol Energy Company, Emery Deep Mine, C0150015, Task # 4363

**SUMMARY:**

The Mine was placed into temporary cessation status on February 16, 2010; all mining activities were ceased at that time. Mining was last conducted in 2nd Right and 00 North. The Emery Mine permit was re-issued January 6, 2011 and the midpoint of the permit term is July 6, 2013. On May 31, 2013, the Division notified the Permittee concerning the midterm review required by R645-303-211. The MRP Chap III, p 4a states a commitment to enhance the existing reclamation plan, in accordance with successful treatments used in the past, through a four phase plan. Phase 1 of the plan has been accomplished.

Progress towards Phase 2 was last made towards this goal in October 11, 2011 (see Inspection Report #2895). The plan of action was determined on October 11, 2012, but there was no time left in that year to obtain funding and implement the strategy. The plans as described should be initiated in 2013.

The following deficiency is written to accomplish Phase 2 of the reclamation plan evaluation.

**R645-301-241 and R645-301-341**, Chap III, p. 4a, item 2 states, "Based on findings from the investigative study, plans shall be developed to enhance the vegetation of each site." The following revisions should be made to the reclamation plan (as discussed during a site visit on October 11, 2011):

1. Stockpiles should be graded to gentle slopes (4h:1v) and have only shallow roughening, such as ripping on the contour, to allow water infiltration but to avoid water impoundment;
2. All sites should have 1 T/ac straw mulch incorporated with discing or ripping;
3. The seeded soil surface should be partially covered with a layer of wood-straw or gravel mulch to limit evaporation from the soil surface;

4. Subsoil and topsoil stockpiles should be fenced to keep out livestock.
5. Modify the seed mix to include only salt tolerant species and allow for a higher percentage shrubs and forbs that were noted to be successful. i.e. 4-wing saltbush, shadscale, gardner saltbush, mat saltbush, greasewood.
6. Adjust Reference Areas to eliminate duplication. [PWB]

**R645-301-352**, The following locations should receive contemporaneous reclamation using the revised reclamation plan described above:

1. Lower the profile of pond 6 stockpiles, reseed and keep livestock off the piles.
2. Reclaim ponds 4 & 5 which serve no present function.
3. Reclaim Pond 1 Subsoil Pile.

The Permittee should begin work on the above permitting revisions and contemporaneous reclamation tasks this field season (summer/fall 2013) to allow warm season planting and provide documentation of progress made towards achieving the above goals in the 2013 Annual Report. [PWB]

**TECHNICAL ANALYSIS:**

**RECLAMATION PLAN**

**GENERAL REQUIREMENTS**

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

**Analysis:**

As described on page 4a of Chapter III, the Permittee has agreed to follow a four-phase evaluation of past reclamation practices in order to update the final reclamation plan with best technology for the conditions at Emery.

In phase 1, the Permittee investigated soils and vegetation at contemporaneously reclaimed sites and reference areas at the Emery Mine. That information was compiled in 2003 and is found in the MRP Chap III, App III-1. Within App. II-1, the Soils Report Appendix A provides the chemical quality information for 15 sites in various stages of reclamation and 6 associated reference areas.

SAR values range from a low of 0.6 at the surface of the Mixed Desert Shrub reference area (site 18) to a high of 32 at the surface of the Pond 1 subsoil stockpile (site 14). Site 5 (pond 6 subsoil stockpile), site 6 (pond 6 banks), site 8 (borehole reclaimed road), site 10 (topsoil pile #1), site 11 (pond 1 banks), site 14 (pond 1 subsoil pile), site 20 (canyon bottom road) and site 21 (pond 4 area) have elevated EC and SAR values. Water is the limiting factor for vegetation growth in these saline/sodic soils. Pond 1 and pond 6 banks had high SAR values, also productive cover of 38.5 - 39.5% due to available water.

The gypsum meq/100g soil was evaluated and found to be sufficient at most sites, indicating that the exchange of calcium for sodium in the soil, would be facilitated by irrigation, if there were adequate drainage.

The Division and Emery Mine representatives reviewed the reclamation sites on October 12, 2011; refer to Inspection Report #2895 for details. At which time, it was agreed that the reclamation plan would be modified to incorporate beneficial treatments observed and those recommended based on soil chemistry provided in App II-1:

TECHNICAL MEMO

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1. Stockpiles should be graded to gentle slopes (4h:1v) and have only shallow roughening, such as ripping on the contour, to allow water infiltration but to avoid water impoundment;
  2. All sites should have 1 T/ac straw mulch incorporated with discing or ripping;
  3. The seeded soil surface should be partially covered with a layer of wood-straw or gravel mulch to limit evaporation from the soil surface;
  4. Subsoil and topsoil stockpiles should be fenced to keep out livestock.
1. Modify the seed mix to include only salt tolerant species and allow for a higher percentage shrubs and forbs that were noted to be successful. i.e. 4-wing saltbush, shadscale, gardner saltbush, mat saltbush, greasewood.
  2. Adjust Reference Areas to eliminate duplication.

Based on this information, and in consultation with the Division, the best techniques demonstrated to be successful would be applied at contemporaneous reclamation sites in Phase 2. On October 12, 2011, it was agreed that the following locations would receive contemporaneous reclamation using the best technology identified by the Phase 1 review :

1. Lower the profile of pond 6 stockpiles, reseed and keep wildlife off the piles.
2. Reclaim ponds 4 & 5 which serve no present function.
3. Reclaim Pond 1 Subsoil Pile.

In phase 3, the applied techniques will be evaluated qualitatively annually and quantitatively between the 4<sup>th</sup> and 6<sup>th</sup> year. These evaluations will be correlated to precipitation data results obtained from an on-site weather station and incorporated into the annual report. In Phase 4, the Permittee will revise the MRP to include the best technology for final revegetation. A full scope of work for this four-phased evaluation will be submitted to the Division by the end of March 2003, but was deferred until 2007 (Chapter III, Page 4a).

**Findings:**

**R645-301-241 and R645-301-341**, Chap III, p. 4a, item 2 states, "Based on findings from the investigative study, plans shall be developed to enhance the vegetation of each site." The following revisions should be made to the reclamation plan (as discussed during a site visit on October 11, 2011):

1. Stockpiles should be graded to gentle slopes (4h:1v) and have only shallow roughening, such as ripping on the contour, to allow water infiltration but to avoid water impoundment;
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**TECHNICAL MEMO**

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6. Adjust Reference Areas to eliminate duplication.

**R645-301-352**, The following locations should receive contemporaneous reclamation using the revised reclamation plan described above:

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The Permittee should begin work on the above permitting revisions and contemporaneous reclamation tasks this field season (summer/fall 2013) to allow warm season planting and provide documentation of progress made towards achieving the above goals in the 2013 Annual Report.

**RECOMMENDATIONS:**

The plan of action was determined on October 11, 2012, but there was no time left in that year to obtain funding and implement the strategy. The plans as described should be initiated in 2013.