

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

JK

February 29, 2008

TO: Internal File

THRU: Daron R. Haddock, Permit Supervisor 

FROM: Steve Christensen, Environmental Scientist II 

RE: Refuse Drainage to Pond 8, Consol Coal Company, Emery Deep, C/015/0015, Task ID #2929

SUMMARY:

The Division of Oil, Gas and Mining (the Division) issued Consol Coal Company (the Permittee) a violation relative to the temporary refuse pile. Division inspector Karl Houskeeper issued the violation (#10005) upon observing the limited capacity of the receiving drainage channels that accept storm runoff from the refuse pile.

On September 10th, 2007, the Permittee submitted information in response to the violation. On October 31st, 2007, the Division concluded it's first technical review of the submittal and mailed a letter to the Permittee that identified several deficiencies that needed to be addressed (Task ID #2852). The Permittee submitted a response to those deficiencies on November 9th, 2007. The second hydrologic analysis for Violation #10005 was conducted and a deficiency letter was sent to the Permittee on January 14, 2008. The Permittee submitted the response to the January 14th document by submitting additional information to the Division on February 15th, 2008.

Upon review of the February 15th, 2008 submittal, the Permittee has adequately addressed the hydrologic deficiencies identified by the Division relative to NOV #10005.

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TECHNICAL ANALYSIS:

OPERATION PLAN

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Refuse Piles

The application meets the Spoil and Waste Materials requirements as outlined in R645-301-745, -746 and -747.

It is the intention of the Permittee (as outlined in the submittal) for the existing coalmine waste pile to remain in its current location as the active refuse pile until mining activity ceases. The existing coalmine waste pile is often referred to in the approved MRP as the 'northwest coal stockpile area'.

Upon the completion of mining activity, the Permittee intends to remove the existing refuse pile and bury it in the previously approved permanent development waste disposal site located directly east of the existing location (See Plate II-1, *Structures and Facilities Main Portal Area*). The permanent disposal area is approximately 2 acres and located at a gravel borrow pit area east of the northwest coal stockpile area. Chapter IV.C4 Figure 1, *Existing Coal Mine Waste Pile Plan and Cross-Sections*, provides three cross-sections of the current waste rock pile. Plate IV-4, *Permanent Underground Development Waste Disposal Site Plan and Cross Sections*, provides nine cross-sections depicting the topography and contours to be constructed at the permanent waste disposal site.

Drainage designs are provided in Chapter VI Appendix VI-6. The Permittee utilized a 100-year 24-hour storm event for the design of drainage ditches receiving runoff from the refuse pile areas (both the existing site as well as the permanent refuse location). R645-301-746.212 requires refuse ditch design to utilize a 100-year, 6-hour event. The Permittee utilized the SCS method as well as the HEC-HMS computer model in determining peak flow rates generated from the refuse pile drainage areas. The ditches were designed to maintain flow velocities below 4.0 feet per second (fps) for earthen channels and less than 12 fps for rock channels during the 100-

year 24-hour storm event. The Permittee commits to utilizing rip rap where necessary (Chapter VI, Appendix VI-6, Page 1 of 38).

Beginning on page 1 of 38 in Chapter VI, Appendix VI-6, the Permittee outlines the drainage calculations utilized for the existing and proposed permanent refuse disposal site. Page 26C of 38 provides an overview of the assumptions and design considerations utilized in the HEC-HMS modeling runs. The model was based on watershed and sub-basin information from the Reclamation Phase of the operation. The modeling was performed on the reclamation phase conditions because the produced peak flows and total runoff are higher during the reclamation phase than the operational phase.

Existing Refuse Pile

Drainage designs are provided in Chapter VI Appendix VI-6. The Permittee utilized a 100-year 24-hour storm event for the design of drainage ditches receiving runoff from the existing refuse pile area. R645-301-746.212 requires refuse ditch design to utilize a 100-year, 6-hour event. The Permittee utilized the SCS method as well as the HEC-HMS computer model in determining peak flow rates generated from the refuse pile drainage area. Page 26C of Appendix VI-6 depicts the drainage network utilized in the HEC-HMS modeling runs. The ditches were designed to maintain flow velocities below 4.0 feet per second (fps) for earthen channels and less than 12 fps for rock channels during the 100-year 24-hour storm event. The Permittee commits to utilizing rip rap where necessary (Chapter VI, Appendix VI-6, Page 1 of 38).

Pages 1-38 of Chapter VI, Appendix VI-6 provide the peak flow calculations utilized for the existing refuse pile's ditch designs. A description/narrative of the design considerations for each of the drainage ditches is also provided. Appendix VI-7 provides the design considerations and calculations for the mine's sediment ponds. Drainage from the existing refuse pile is diverted and ultimately discharged to Pond 8 (See Appendix VI-7, *Pond No. 8 Plan View and Drainage Map*). *Pond No. 8 Plan View and Drainage Map Operations Phase* of Appendix VI-7 depicts the watershed boundaries of the existing refuse site as well as the sub-watershed boundaries utilized during the design of the various elements of the areas drainage network (i.e. ditches, culverts).

Direct runoff from the existing refuse pile is routed through ditches 2A and 2B. The drainage from these two ditches is routed into Ditch 1B. The combined runoff is diverted primarily through a 24" corrugated metal pipe (CMP) labeled Culvert B on *Pond No. 8 Plan View and Drainage Map Operations Phase* of Appendix VI-7. The discharge then flows approximately 400' east to Culvert C (24" CMP) as depicted on *Pond No. 8 Plan View and Drainage Map Operations Phase*. Culvert C conveys drainage from Culverts A and B as well as storm runoff from watershed E to Pond No. 8 (See *Pond No. 8 Plan View and Drainage Map Operations Phase*- Appendix VI-7). The Permittee utilized a 100-year, 6-hour event in it's HEC-HMS runs to determine the peak flows ultimately reporting to Culvert C prior to their

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ultimate discharge into Pond No. 8. Based upon the invert elevation of Culvert C (5,926.7') and the top of the road/top of ditch elevation (5,931'), a maximum allowable pool depth of 4.3' was established before overtopping occurred. The HEC-HMS modeling runs of the 100-year, 6-hour event produced a headwater depth of 2.6 feet during peak flow. Based upon the presented modeling information, 1.7' of freeboard is maintained during the design storm event.

The Division's technical analysis #2852 identified a deficiency with R645-301-746.212. R645-301-746.212 states that uncontrolled surface drainage may not be diverted over the outslope of the refuse pile. Chapter VI, Appendix VI-6, Page 26G discusses the surface runoff generated from the top of the existing refuse pile. Peak runoff from the surface of the refuse pile for the 100-year is approximately 1.0 cubic feet per second (cfs). Due to the minimal runoff generated from the design storm event, runoff controls are not necessary for the surface of the refuse pile.

Permanent Refuse Disposal Site

As stated previously, the Permittee intends for the existing refuse site to be active until final reclamation of the mine site. Underground development wastes currently located at the existing refuse disposal site (and any future development wastes) will be buried in the permanent refuse disposal site depicted on Plate II-1, *Structures and Facilities Main Portal Area*. The site will be developed by removing all in-place soil above an elevation of 5,980 feet, with the eastern boundary of the disposal area cut at a slope of 1.5H:1V. The permanent refuse disposal site will bury the waste presently located on the northwest coal stockpile (existing refuse pile).

The permanent refuse site has been designed to route all of the generated storm runoff from the site into Pond No. 8. Beginning on page 1 of 38 in Chapter VI, Appendix VI-6, the Permittee outlines the drainage calculations utilized for the proposed permanent refuse disposal site. Page 26C of 38 provides an overview of the assumptions and design considerations utilized in the HEC-HMS modeling runs. The model was based on watershed and sub-basin information from the Reclamation Phase of the operation. The modeling was performed on the reclamation phase conditions because the produced peak flows and total runoff are higher during the reclamation phase than the operational phase.

All of the storm water runoff generated from the permanent refuse disposal site will be routed to Pond No. 8. The final topography of the permanent refuse disposal site will be graded such that the runoff will naturally flow off the site (i.e. ditches, diversions will not be necessary to control the drainage). During the operations phase, Pond No. 8 has a drainage of 20.3 acres. Pages 52A through 52J of Appendix VI-7 outline the design considerations for the operations phase. During the reclamation phase (when the existing refuse disposal site is transferred to the permanent refuse disposal site), the drainage to Pond No. 8 will increase to 21.8 acres (addition of 1.5 acres).

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Beginning on page 52K of Appendix VI-7, the Permittee provides the storage volume and design storm runoff calculations for Pond No. 8 under the reclamation phase condition (i.e. all storm water runoff from the permanent refuse site diverted to Pond No. 8). The storage calculations for Pond No. 8 utilized a 100-year, 6-hour event from the entire watershed reporting to Pond No. 8. As such, the calculations are beyond regulatory requirements. The design storm event (100-year/6-hour) produces a peak pool elevation of 5,911.7 feet. The dam crest at Pond No. 8 has an elevation of 5,915 feet providing a freeboard of 3.3 feet during the 100-year, 6-hour design storm event. The Permittee has demonstrated that Pond No. 8 is adequately sized to fully contain the runoff generated from the 100-year, 6-hour event during the reclamation phase as depicted on Pond No. 8, *Plan View and Drainage Map Reclamation Phase*.

Findings:

The submittal meets the Refuse Pile requirements of R645-301-746.212.

RECOMMENDATIONS:

The Permittee has adequately addressed the hydrologic deficiencies relative to NOV #10005 and should abate the violation.