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March 4, 1986

TO: Technical File

FROM: Rick P. Summers, Reclamation Hydrologist *RS*

RE: Review of As-built Sedimentation Pond, Draft Copy (dated Decemeber 30, 1986), Genwal Coal Company, Crandall Canyon Mine, ACT/015/032, Carbon County, Utah

Summary:

Designs for the as-built sedimentation pond at Crandall Canyon Mine were reviewed to verify pond construction according to the previously approved proposal. The submittal was stamped as a draft copy and received by the Division on December 30, 1986. Although several intermediate values were in error, the overall design is within 5.8 percent of the Division's calculations. The pond is approvable.

Body:

The following table summarizes the review:

Item	DOGM	Genwal	Percent Difference
Pond area (AC)	0.157	0.17	+ 7.65
Undist. area (AC)	5.995	5.74	- 4.25
Reclam. area (AC)	2.42	2.15	-11.16
Disturbed area (AC)	2.487	2.45	- 1.49
Total runoff (AF)	0.692	0.67	- 3.18
Dist. Sed. Vol (AF)	0.2906	0.25	-13.97
Recl. Sed. Vol. (AF) ¹	0.003	0.01	+70.00
Undst. Sed. Vol. (AF) ¹	0.033	0.03	- 9.09
Total Pond Vol. (AF)	1.1019	0.96	- 5.75

1. Reclaimed and Undisturbed Sediment Volume for DOGM calculations were based upon a 3 year sediment volume (based upon UMC 817.46). Genwal values were based upon a 10 year sediment storage volume, but were found to be in error. This essentially means the applicant will likely encounter a more frequent pond cleanout operation, but will not hinder the function of the pond.

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On August 12, 1986, the Division received a submittal from the applicant revising the spillway design. This was due to an error in the barrel diameter (12 inches vs. 18 inches) in the original proposal. A new stage-discharge curve was prepared based upon this new value (see attached). It was found that the primary spillway will adequately pass the 10 year -24 hour event (8.8 cfs) and the emergency spillway (in conjunction with the primary spillway) will adequately pass the 25 year - 24 hour event (11.91 cfs).

The primary spillway will discharge 9.35 cfs at the emergency spillway elevation of 7784.0 feet. Using the equation for weir controlled flow as presented by Chow (1964, p. 15-33):
 $Q = CL(g)^{1/2}(H)^{3/2}$, a bottom width of 4 ft., and 2:1 sideslopes, it was found that the excess discharge (2.56 cfs) will discharge at a depth of 0.10 feet ($H = (2.56 \text{ cfs} / (3.27 \times 4 \text{ ft} \times (32.2)^{1/2})^{0.667} = 0.106$ feet. This results in an elevation in the emergency discharge flowing at design depth of 7784.1 feet. UMC 817.46 (j) requires that the difference in this elevation and the elevation of the top of the embankment be 1.0 feet. Although this was not a rigorous examination of the spillway, it is adequate to demonstrate the depth of flow in the spillway will be minimal (one inch). Additionally, due to the conservative calculation of the peak flow value, it is felt a variance to this requirement can be given.

cc: Sue Linner
Dave Cline
Jim Leatherwood

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