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TO: Daron Haddock, Permit Supervisor

FROM: James D. Smith, Reclamation Specialist JDS

RE: Technical Analysis, LBA #9 Amendment Stipulation Response, Crandall Canyon Mine, Genwal Coal Company, ACT/015/032, Working File, Emery County, Utah #2

SYNOPSIS

Information was received from Genwal on October 31, 1994 in response to stipulations identified in a UDOGM technical analysis sent to Genwal on September 26, 1994. I had only written one stipulation based on that review, concerning confusion over how spring SP-36 was to be monitored. That stipulation has been satisfactorily addressed and question has been answered. Following is a new TA with a "Finding" that the section of the plan dealing with ground water monitoring is complete and accurate.

R645-301-731.210 Ground Water Monitoring Plan

Discussion:

Tables 7-4 and 7-5 list the parameters for which operational and baseline ground water monitoring are done. Samples are collected and analyzed according to the current edition of "Standard Methods for the Examination of Water and Wastewater" or the methodology in 40 CFR Parts 136 and 434. Reports are submitted to UDOGM quarterly, followed by an annual summary. All test and measurement instruments are operated, maintained, and calibrated according to the manufacturer's instructions.

Seep and spring locations are on Plate 7-12. Groundwater monitoring included collection of water quality and quantity data from sixteen springs up through the spring of 1994 (pages 7-40 and 7-42). SP2-24, SP2-9, SP-47a, SP2-14, SP2-23, and SP1-3 were chosen because of the water rights filed on them by the USFS. SP-30 and SP-36 have been monitored to determine potential impacts in the immediate vicinity of the mine. SP-58 has been monitored as an indicator of long term changes in groundwater issuing from the

Blackhawk Formation in an area that will not be affected by mining operations. SP1-19 and SP1-22 have been monitored as indicators of the water supply in the upper reaches of Blind Canyon. SP1-33, SP1-47, and SP2-1 were monitored for indications of changes in ground water issuing into Joes Valley from near the base of East Mountain. SP1-9 and SP1-24 were monitored for effects from subsidence in the state leases.

According to Appendix 7-17 and Annual Reports for 1990, 1991, 1992, and 1993, spring SP-30 has had no measurable flow since October 1985. Genwal intends to continue monitoring SP-30 to observe flow trends as they relate to precipitation patterns.

SP-58, SP-36, SP2-9, SP2-24, SP1-33, and SP1-9 will continue to be monitored quarterly for quantity and quality. Genwal proposes that SP-30, SP2-1, SP1-47, SP1-24, SP-19, SP-47a, SP1-3, and SP1-22 will be monitored quarterly for quantity and other field parameters only. Springs SP2-14, SP2-23 will no longer be monitored because there has been little or no flow and adjacent spring SP2-9 will continue to be monitored.

SP2-14 and SP2-23 are the only seeps or springs that have been monitored in the north fork of Horse Canyon, in an area that is scheduled for full extraction mining beginning in 1998 under the currently approved plan. The nearest spring that is to be monitored is SP2-9. That spring is located approximately one-quarter mile south of SP2-14, in the south fork of Horse Canyon but barely across the divide between the two forks. S2-9, which was flowing 8 gpm in June 1993, has greater and apparently more consistent flow than SP2-14 and SP2-23. S2-9 will be subject to subsidence of similar timing and magnitude as SP2-14 and SP2-23. The proximity of SP2-14 and SP2-23 to SP2-9 and their low discharge rates support the assertion that continued monitoring of SP2-14 and SP2-23 would probably be of marginal value.

The fourteen springs listed above are to be monitored quarterly, but frequency may vary according to accessibility. After reclamation and up to release of the bond, springs will be monitored semiannually and water samples analyzed according Table 7-4. During both operation and reclamation, samples collected during the low flow period (usually the fourth quarter) in the years 1990, 1995, 2000 and at 5-year intervals thereafter until bond release will be analyzed according to Table 7-5.

DH-1, which flows from the roof of the mine, is also monitored quarterly. The active portion of the mine will be inventoried quarterly for mine inflows that exceed three gpm. UDOGM will be consulted to determine if monitoring of additional mine inflows is needed and to establish a schedule for monitoring. Monitoring of mine inflows will continue as long as they are safely accessible. Quarterly analyses of mine inflows are to be done according to Table 7-4. Samples of mine inflows collected during the low flow period in the years 1990, 1995, 2000 and at 5-year intervals thereafter are to be analyzed according to Table 7-5.

Monitoring wells MW-1, MW-2, MW-4, and MW-5 will be monitored quarterly for water levels and water quality. Quarterly analyses are to be done according to Table 7-4. For a two year period following completion of a well and in the years 1990, 1995, 2000, and

at 5-year intervals thereafter, analyses of water samples from wells are to be done according to Table 7-5. Wells that remain accessible will continue to be monitored by this schedule until two years after the completion of surface reclamation. MW-1 will continue to be monitored annually until bond release.

Findings:

The plan for ground water monitoring, during both operation and reclamation, is complete and accurate.

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