

TECHNICAL ANALYSIS

Tank Seam Road
Co-Op Mining Company
Bear Canyon Mine
ACT/015/025

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FILED

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SECRETARY, BOARD OF
OIL, GAS & MINING

BIOLOGICAL ANALYSIS

R645-301-321. Vegetation Information.

Plate 9-1, Vegetation Map, is included in the submittal for the proposed Tank Seam Road and Portal Pad. The new vegetation map has been updated to include the Tank Seam reference area. The existing vegetation in the area of the proposed disturbance is included on the map.

An inspection of the proposed road was made by Forest Botanist Robert Thompson on November 4, 1993, for threatened, endangered and sensitive plant species (page 9B-5). He stated that the area was clear of any species of concern.

R645-301-322. Fish and Wildlife Resource Information.

No additional fish and wildlife resource information specific to the Tank Seam road and portal pad was provided in this amendment. The resource information included in the permit is general enough to cover this area which is close to the other disturbed areas. The raptor survey included the proposed area of disturbance. The entire area is classified as critical deer and elk winter range.

A letter dated December 23, 1992 from DWR (page 10D-18) recommended the current proposed road route over other alternative routes because of less impact. The letter states that the known golden eagles nest within one-half mile of the road are not located in direct line of site. However, the lower cliff areas are potential Townsend Big-eared bat habitat. A survey of the area for this species must be complete prior to construction of the road and pad as required by R645-301-322.100.

R645-301-410. Land Use.

No amendment to the plan has been made for this section. The stated premining land use for the area is wildlife and grazing. R645-301-411.110 requires the amendment to state the current land use for the area which in this case would be only wildlife. Due to the steepness of the site, livestock grazing would be prohibitive.

The current productivity of the area to be disturbed has not been described as required by R645-301-411.100. The Division will accept a letter from the SCS which states the estimated current and potential productivity of the reference area to fulfill this requirement.

EXHIBIT B

Stipulations

6. The Operator must expose bedrock when needed to ensure that the slope is stepped.
7. The Operator must test fill material prior to placement.
8. The Operator must submit detailed slope profiles and stability analysis for each fill-slope.

BASELINE DATA

R645-301-729. Cumulative Hydrologic Impact Assessment

Revised Hydrologic Evaluation of the Bear Canyon Mine

In the review of additional information to put together the 'Revised Hydrologic Evaluation of the Bear Canyon Mine' the following items were considered: 1) the updated PHC (Probable Hydrologic Consequences) data submitted by Co-Op Mining Company, and 2) the September 9, 1993 informal hearing transcripts.

Ground Water

Within the vicinity of the Bear Canyon Mine, two major springs have been identified: Big Bear Springs and Birch Springs. Big Bear Springs (maintained by the Castle Valley Special Services District) discharges from three prominent joints. Birch Springs (maintained by the North Emery Water Users) discharges from the normal fault which has approximately 20 feet of vertical displacement. Both springs discharge from the lowest sandstone unit of the Star Point Sandstone (Panther Tongue), where the Mancos Shale acts as a barrier to the downward movement of groundwater. As a result of the Order issued by the Division of Oil, Gas and Mining, Co-Op Mining Company initiated a drilling program to better define the ground water flow path associated with the Blackhawk-Starpoint aquifer in the area of the mine.

Although a regional aquifer (termed the Star Point - Blackhawk Aquifer by Danielson, et al., 1981) has been designated for the area, in-mine drilling and aquifer testing conducted for this study area indicate that three aquifers within the Star- Point Sandstone have individual static water levels. Further, in the southernmost hole (DH-3) shown on Plate 2, PAP, none of the three aquifers are fully saturated. This fact indicates that each of the units have a separate and distinct water levels. The springs issue from the bottom of the Panther Tongue (417 - 433 feet below the Blackhawk formation contact with the Star Point Sandstone), therefore, Birch Springs and Big Bear Springs are hydrologically isolated from the impacts of

mining in the Blackhawk Formation by the presence of two Mancos Tongues in the Star Point Sandstone.

Areas of encountered groundwater within the mine are fractures which drain over a period of several months as the mine advances northward. This indicates a high degree of hydraulic interconnection through fractures in the portion of the Blackhawk Formation which overlies the mine. Inflows in the north end of the North Main and Second East entries are through roof bolt holes and hairline fractures which are presumed to drain overlying perched aquifers in the Blackhawk Formation. The current rate of discharge from the mine is approximately 300 GPM.

Big Bear Springs and Birch Springs in the vicinity of the Bear Canyon Mine issue from joints at the contact between the Panther Tongue and the Mancos Shale. The majority of water inflows in the mine are through bolt holes and fractures draining perched aquifers in the Blackhawk and an indeterminate amount of interception of water from the floor in the area of the Second East entries. The review of water source information, the graphical tracking of precipitation versus flow, the testing of the spring water and mine water quality for tritium dating, analysis of water quality chemical data using Stiff and Piper diagrams, and the known presence of three separate piezometric surfaces based on drilling in the Spring Canyon, Storrs, and Panther Tongues of the Star Point Sandstone leads to a conclusion of no significant material damage to the Hydrologic Balance outside the permit area.

Future Mining in the Tank Seam above the Bear Canyon Seam

The Co-Op Mining Company has drilled 8 exploratory drill holes into the Tank Seam (page 2-13, Appendix 7 - J, PAP). All were dry except one which flows at .5 GPM (drilled up from the mine workings in the Blind Canyon Seam). The inflows into the Tank Seam are expected to be much less than those encountered in the Blind Canyon Seam. Stratigraphically, the Tank Seam is 250 feet above the Blind Canyon Seam and therefore, would tend to be drier and not expected to have the ground water inflows found in lower coal seams (i.e., the Blind Canyon and the Hiawatha Seams). There has been no continuous water quality problems associated with mine water discharge at the Bear Canyon Mine and therefore it is not expected to change in the future, although it will be closely watched for any long term trends.

Surface Water

The Permittee has submitted information in their PHC which documents the quality and quantity of surface water routinely collected in the permit and adjacent areas from stations located on Bear Creek and Trail Creek. Analytical data from these sources are summarized in Chapter 7 of the PAP and the Annual reports. Locations of these monitoring points are

presented on Plate 7-4 of the PAP. The following potential impacts are discussed in the PHC on pages 3-10 thru 4-3:

- Contamination from acid- or toxic-forming materials;
- Increased sediment yield from disturbed areas;
- Flooding or stream flow alteration;
- Impacts to the chemical quality of surface water; and
- Impacts to surface water quantity.

The Permittee has provided a summary of the potential impacts based on the Potential Magnitude of Impact and the Probability of Occurrence. The two potential impacts to surface water quality with moderate or high probability of occurrence are in order, road salting and mine discharge. Both potential impacts are being monitored, by monitoring treatments in place (i.e. sediment ponds). Any mitigation of road salting within the permit area will be based on UPDES permit requirements. The monitoring of discharge and underground occurrence are in place to determine if mitigation measures are needed.

The Permittee has provided an adequate erosion and sediment control plan for reclamation of the Tank Seam and therefore a Cumulative Hydrologic Impact Assessment can be completed.

Finding

The Permittee has met the requirements of the rules regarding the collection of Baseline ground and surface water data. The Permittee has also provided an accurate assessment of the potential impacts from mining the Tank Seam. The Permittee has met the requirements of the rules regarding erosion and sediment control for reclamation.

EROSION AND SEDIMENT CONTROL

R645-301-741 thru
742.126 and 742.240 Sediment Control Measures

Operation Plan

The Permittee is proposing to build a road and pad area isolated from the normal sediment control facilities at the main facilities area in steep canyon which is considered a space limited environment. Therefore, the Operator has decided to treat all disturbed areas using alternative sediment control (i.e., silt fence and erosion control matting). The Permittee meets the regulatory requirements of R645-301-741 through 742.126 and 742.240. The construction procedures for installation of sediment controls are described on pages 3H-