0037

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
Governor
Kathleen Clarke
Executive Director
Lowell P. Braxton
Division Director

1594 West North Temple, Suite 1210
PO Box 145801
Salt Lake City, Utah 84114-5801
801-538-5340
801-359-3940 (Fax)
801-538-7223 (TDD)

November 27, 2001

TO: Internal Files

THRU: Peter H. Hess, Sr. Reclamation Specialist/Engineering, Team Lead PHH

FROM: Michael J. Suflita, Sr. Reclamation Specialist/Hydrology MJS

RE: MRP Sec. 5 & Exhibits 13 & 17, Revised Reclamation Plan, Plateau Mining Corporation, Willow Creek Mine, C/007/038-01B-1

SUMMARY:

On February 12, 2001, the Division received amendment AM01B, a revised reclamation plan for the entire Willow Creek Mine. On July 13, 2001 the Division responded to the submittal with a Technical Analysis containing deficiencies. On October 12, 2001 the Division received a response and this Technical Memo is a review of the Hydrologic aspects of that submittal. There are no deficiencies.

TECHNICAL ANALYSIS:

RECLAMATION PLAN

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

General

The amendment proposes to revise the Reclamation Plan from a phased, to a single-step plan. Originally, some sediment ponds, ditches, and roads were to be left initially and reclaimed later. This amendment calls for the reclamation of the entire site in one continuous operation. Otherwise, the Reclamation Section of the MRP (Mining and Reclamation Plan) remains the same. The amendment includes revisions to Sections 5.2, 5.3, 5.4, 5.5, Exhibit 13, Appendix H-1, Appendix H-4, and the Bond Estimate. The new Reclamation Plan is considerably simpler than the old one.

Ground-water monitoring

Ground-water monitoring requirements remain unchanged from that originally approved. See page EX 13-31.

Surface-water monitoring

Surface-water monitoring requirements remain unchanged from that originally approved. See page EX 13-31.

Acid and toxic-forming materials

No changes from the original MRP.

Transfer of wells

No changes from the original MRP.

Discharges into an underground mine

No changes from the original MRP.

Gravity discharges

No changes from the original MRP.

Water quality standards and effluent limitations

No changes from the original MRP.

Diversions

Compared to the current MRP, the new diversions are noticeably shorter and have a more direct path from the drainage area to Willow Creek or the Price River. This arrangement is closer to the original ground configuration and should function more naturally. There is a significant change in the design event used for determining the channel size. The old plan used a 100-year, 6-hour storm and the amendment changes that to a 10-year, 6-hour event. As discussed in paragraphs 742.320 and 742.330 of the regulations, this lesser design event is appropriate. All the drainages resulting in reclamation diversions are defined as ephemeral streams. As such, the 10-year, 6-hour design event is appropriate.

The design of the diversion channels with riprap lining was all checked. The runoff curve numbers remained the same from the original MRP; however, the Manning changed slightly. Riprap sizes D_{50} were checked and werefound to be appropriate for the channels. Where needed, rock filters were provided under the riprap (Reference Appendix H-1, Reclamation Diversion Design).

Diversion channel profiles are generally configured to be concave up. WCRD-4 is a good example. This shape is the most stable and least erosive, and therefore, most desirable.

Typically culverts and roads are removed during reclamation. As shown on Maps 21C and 21E, five culverts will be left as part of the permanent reclamation. A dirt road will also be retained. The post-mining land use is wildlife and recreation. In addition, the site is a main thoroughfare for several utilities. The road and culverts will be retained in the reclamation for access to that utility corridor. The road and the culverts were there before Willow Creek Mine was opened, have been maintained during the operation phase of the mine, and will remain after reclamation. The culverts include the one crossing Willow Creek from the State highway, one under the railroad tracks, and those under the utilities access road.

Another significant change from the original MRP is the use of erosion control matting instead of rock riprap in 15 of the 23 reclamation diversion channels. Reference Table 13-13, page EX13-34, and Appendix H-1, starting on page22. Appendix H-1 describes the erosion control mat as Pyramat and commits to installation according to the manufacturer's instructions. The matting is installed on top of the finished subgrade and then 3 inches of topsoil is placed on the matting. Then the channel is "revegetated as with the rest of the reclaimed area." Also described are two "Standard Swales" used to line the channels. Comparison of the swales is shown in the following table.

Swale No.	Maximum Flow Capacity	Bottom Width	Side Slope	Maximum Flow Depth	Minimum Freeboard
1	5 cfs	4 feet	5:1	0.5 foot	0.5 foot
2	3 cfs	2 feet	3:1	0.5 foot	0.5 foot

The use of erosion control matting is a relatively new reclamation technique. Those instances where it has been used in Utah for final reclamation were not successful and led to ongoing maintenance problems. There were; however, installation and design issues that probably contributed to those failures. As such, the Division is willing to allow the use of erosion matting only under controlled conditions. The amendment provides manufacturer literature that appears to show that the proposed matting is being used under conditions for which it was designed. Examples include maximum water velocity, ultraviolet resistance, and soil burial depths. As always, the Operator is responsible for reclamation success and must achieve that success before bond release. In the event of erosion matting failure, the Operator would be required to repair the failure, possibly including riprapping of the channels.

Stream buffer zones

No changes from the original MRP. The nature of site reclamation requires working in the stream channels and the Division approves those reclamation activities within the Buffer Zone.

Sediment control measures

As shown on Maps 22A and 22B, the new slope configurations are all concave up. This is the Best Technology Currently Available and is a shape that the Division has recently asked Operators to use in their reclamation plans. This shape is closest to natural slopes, and therefore, the most stable. It results in the least erosion and best long-term performance. The Division appreciates the Operator incorporating this design.

Pages 5.5-5 and EX 13-33 indicate, "Corrective action will be taken when a gully greater than 9 inches is created. This corrective action will consist of working the ground surface sufficiently to fill the adjacent gully, and reseeding and mulching if necessary to reestablish vegetation." While this will be adequate in many areas, it may not work in others. An example might include steeper sections of the reclaimed area. In the event the described method is inadequate, the Operator will be required to take whatever action is needed to fix the gully and prevent its reoccurrence. This would include correcting the cause of the water concentrating to form the gully, stopping the "nickpoint" at the head of the gully, and, possibly, filling the gully with imported soil.

Sedimentation ponds

The revised reclamation plan removes all four sediment ponds in a single phase of reclamation. The ponds will be filled and the area returned to Approximate Original Contour. Reference pages 5.4-7 and 5.4-2.

Findings:

Information provided in the proposed amendment is considered adequate to meet the requirements of this section.

RECOMMENDATIONS:

The amendment can be approved in its present form.