STATE OF COLORADO

DIVISION OF RECLAMATION, MINING AND SAFETY
Department of Natural Resources

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MEMORANDUM

To: Travis Marshall

From: Tim Cazier, P.E.

Date: May 24, 2013

Re: SM-18 Mine Drainage Design Plan – Second General Stormwater Comments, Permit No. M-1978-116 / AM-02

The Division of Reclamation, Mining and Safety (DRMS) engineering staff has reviewed the Response to Adequacy Review #2 for the SM-18 Mine prepared by Cotter Corporation and O'Connor Design Group, Inc., dated May 1, 2013. The following comments are posed to ensure adequate engineering analyses and design practices are implemented to eliminate or reduce to the extent practical the disturbance to the hydrologic balance expected by the mining operation with respect to water quality and quantity in accordance with Rules 3.1.6(1), 6.4.21(10) and 7.3.1. Please note, as this site is a designated mining operation (DMO), compliance with Rule 7.3.1 is applicable, thus requiring certified designs and specifications for engineered elements associated with the environmental protection plan (EPP). The original comment numbers have been retained for the purpose of tracking responses.

1. Page ESWMP-5, section7.2. The response to this comment is adequate.
2. Page ESWMP-5, section 7.3. The narrative response to this comment is adequate. {*Note: The "Table 802C" has a hand drawn arrow pointing to "Grassed" Manning's n values. Grass lined channels as determined by Ven Te Chow do not exist naturally in arid regions (i.e., without irrigation). Below is an image of a typical grass-lined channel. None of the photos in Attachment 6 indicate a grass-lined channel exists on site*}.

3. Curve number data. The narrative response to this comment is adequate.

4. Page ESWMP-6, second paragraph, "Haested FlowMaster" output. The selected Manning's n values and estimate peak flow velocities are adequate, but the statement that "These new calculations indicated that the required freeboard of 0 5 ft is provided by the existing channels with no need to adjust channel depths." is in error. The "Irregular Channel Worksheets" in FlowMaster were used to perform hydraulic calculations. These worksheets require X-Y data for channel geometry. Apparently the highest channel elevation was used to calculate freeboard. The lowest "top of bank" should be used instead. There are two channels (10-5 and 10-6) with less than the required 0.5 feet of freeboard and channel 20-3 is suspect. Based on the channel cross-section provided in Sheet 4 of 11 for Section 20-3, it appears the lowest bank elevation is approximately 5379.1 instead of the 5379.59 as labeled on the drawing.

    a. Sheet 3 indicates the slope for channel 10-2 is 5.31 percent. The FlowMaster worksheet for Section 10-2 uses a slope of 5.301 percent. Please double check the slope and make corrections as necessary.

    b. Please provide narrative and drawing(s) indicating how the freeboard will be increased for channel sections 10-5 and 10-6.

    c. Please double check the cross-section for channel 20-3 and make the necessary adjustments and/or corrections to ensure adequate freeboard for channel 20-3.

5. Page ESWMP-6 and 7, sections 7.4 and 7.5 and Retention Ponds Drainage Design Plans. The narrative response to this comment is adequate. However, there are some anomalies with the weir calculations I Attachment 6 and some design omissions in Attachment 7.

    a. Attachment 6, weir calculations: There are three anomalies with each of the three weir calculation worksheets: 1) The tailwater elevation is higher than the crest elevation, suggesting the weirs operate under submerged conditions. This is contrary to the designs shown in Attachment 7; 2) The crest breadth is 5.0 feet for all three weirs. Based on information in the Attachment 7 drawings, the crest breadth at the top of riprap is 11.0, 13.4, and 8 feet for Ponds 10, 20, and 30, respectively; 3) The broad crested weir worksheets assume a rectangular cross section for the analyses. The drawings in Attachment 7 indicate the weirs have 2H:1V side slopes. Please provide a narrative addressing each of these anomalies, explaining the reasons for these assumptions and/or making corrections.

    b. Attachment 7, design drawings: The design drawings do not indicate whether or not the spillway channels downgradient of the weir section are lined with riprap or not. Please indicate on the plan views of each pond spillway these spillway channels are lined with riprap to at least 10 feet beyond the toe of the embankment, and dimension the width of the riprap-lined portion of the spillway channel.

6. Page ESWMP-7, section 7.5 and Page ESWMP-23. The response to this comment is adequate.

7. Please address the reclamation/post mining plan for the retention ponds. The response to this comment is adequate.

DDP Drawings:

8. Sheets 1 and 5 of 5. Please see Comment 5b above.
9. Sheets 3 and 4 of 5. The response to this comment is adequate.
10. Sheet 4 of 5. The response to this comment is adequate.

General Comments:

11. Sheet 1 of 5 channel/ditch sections. The response to this comment is adequate.
12. Page ESWMP-5, first paragraph 7. The response to this comment is adequate.

If either you or the applicants have any questions regarding the comments above, please call me at (303) 866-3567, extension 8169.