COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

MEMORANDUM

To: Hunter Ridley

From: Tim Cazier, P.E.

Date: July 21, 2023

Re: **Hayden Gravel Pit – Permit No. M-1987-164; Amendment 4 (AM-4)**
Exhibit G and Rule 6.5 – Second Adequacy Review

The Division of Reclamation, Mining and Safety engineering staff (DRMS) have reviewed the preliminary adequacy review (PAR) responses dated June 2, 2023 for the Hayden Gravel Pit Exhibit G and Rule 6.5 Geotechnical Stability Exhibit, provided with AM-4 and prepared by Lewicki & Associates. Additional material (times of concentration calculations) not included in the June 2nd submittal were provided via email on July 20, 2023 and were included in this review.

The status of each PAR comment is indicated below using the original comment numbers as reference.

6.4.7 EXHIBIT G – Water Information

1. Groundwater Exposure: The response was adequate.

2. Hydrograph Reports: The response was not adequate. Some additional clarification is required:

    a. SCS Curve Numbers (CN): Originally, three different curve numbers were used: 74 (for apparently undisturbed areas); 89 (disturbed Basin 1 areas); and 81 (disturbed Basins 2 and 3 areas). The response eliminated the 89 value; provided rationale for the 74 value; but did not provide any rationale for the selection of 81. In addition, there appears to be an error in the composite CN for Hydrograph No. 8 (Basin 3, Mining conditions). The composite CN is presented as: [(88.100 x 74) + (52.900 x 81)] / 55.000. This basin was reduced to 55 acres, so the "88.100" is in error and would be expected to be 2.1 acres. Please provide some rationale for the selection of the CN = 81 and correct the composite CN for Hydrograph No. 8.

b. Time Interval: The response was adequate.

c. Times of Concentration: A phone conversation with Ben Langenfeld on July 20th and the emailed times of concentration calculations provided an adequate explanation and response. No further clarification is necessary as these calculations were provided to demonstrate adequate stormwater storage. *[NOTE: as part of the response for the new Comment 3.b.i below; Lewicki and Associates should be aware that a length of 300 feet for sheet flow as part of the NRCS/TR-55 time of concentration methodology is no longer accepted practice. The WINTR-55 software with an accompanying manual (released in 2009) and the updated NEH Part 630 Hydrology, Chapter 15 (released in 2010) limit the maximum sheet flow distance to 100 feet. Additionally, Equation 15-9 (NEH Part 630, Chpt 15) further limits the sheet flow distance based on both roughness and slope.]*

3. Runoff Volume:

   a. Underestimated Volume: The response was partially adequate. Based on Comment 2.a above, the runoff volume for Hydrograph No. 8 should be re-evaluated. Please provide a revised Hydrograph No. 8 report.

   b. Ponds: The response was adequate, but raised new questions related to the newly proposed Pod 3 "stormwater control berm":

      i. Berm Design: As the Pod 3 contributing area was reduced from 141 acres to 55 acres (reference Basin 3 Hydrograph reports); there would appear to be 86 acres contributing runoff to the newly proposed stormwater control berm. Furthermore, the western most 200 feet of the berm drains west at a six percent grade, while the eastern 450 feet drains east on a two percent grade. The berm is expected to concentrate flows such that a channel would appear to be the best practice for erosion control here. Please provide channel designs for both the east and west draining segments of the new berm to their respective natural drainages. (*Please see the italicized note above in Comment 2.c.*)

4. Erosion Potential: The response was adequate. The DRMS will monitor the reclaimed slopes for signs of erosion. The Operator should also perform regular monitoring of reclaimed slopes.

Rule 6.5 EXHIBIT G – Geotechnical Stability Exhibit

5. Clarification Requested: A phone conversation with Ben Langenfeld on July 20th provided an adequate explanation of the midpoint. No further clarification is necessary.

6. Typo: No response was necessary. (*This was also discussed as part of the July 20th phone conversation*.)

Additional Comments

7. Culverts: Several culverts were included in the June 2nd submittal. As part of the July 20th phone conversation with Mr. Langenfeld, it was relayed to the DRMS that most, if not all these culverts may be replaced with low water crossings. Please provide updated plans showing low water crossings in place of culverts; or provide documentation demonstrating each culvert is adequately sized.

If either you or the applicants have any questions regarding the comments above, please call me at (303) 328-5229 [mobile #].