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

Date: October 31, 2023

To: Hunter Ridely, DRMS

From: Patrick Lennberg, DRMS

RE: **NCCI Pit #1, TR-9 Review, Water Level Change and Pit Drain Evaluation Report, Review Memo, File No. M2001-107**

On October 16, 2023, I was requested to review the Water Level Change and Pit Drain Evaluation in the Vicinity of the NCCI Pit Report submitted through TR-9 for the NCCI Pit #1. I also reviewed monitoring well groundwater level measurements that were submitted to the Division as part of an adequacy review response. Below are follow-up questions that should be addressed.

1. Observations and inferences, item 1 indicates the water table east of the NCCI pit is influenced by the Lupton Bottom Ditch (LBD) and Little Dry Creek (LDC). However the Division believes the water table in this area is more influenced by the South Platter River (SPR) and another un-named ditch that runs between the pit and the SPR, please comment.

2. Observations and inferences, item 3, it is stated that the LBD is responsible for the seasonal recharge in wells MW-Z1 and MW-Z2 as large as 8 feet, what observations is this based off of? A review of the discharge records for the LBD it indicates peak discharge typically occurs in June yet peak groundwater levels, in Z1 and Z2, typically occur in September. Additionally, the groundwater elevation data submitted to the Division show other site monitoring wells (MW-Z3, -Z4, and -Z5) also have documented large seasonal fluctuations of groundwater levels in them that cannot be solely attributed to the LBD.

3. The report states, in item 4, that site dewatering pumping rates increased in the summer months due to leakage from LBD and LDC. The report goes on to state, in item 6, that the LDC has no connection to groundwater due to the type of vegetation present in the ditch. Finally, in item 10, it is stated that the LDC has no connection to groundwater as suggested by the model. Please clarify the discrepancy between items 4 and 6 and provide an explanation how the model reflects there is no connection when it appears the model was run on the assumption there was connection between the LDC and groundwater.

4. Observations and inferences, item 6, a review of historic aerial imagery indicates that LDC had no areas of ponding near the NCCI permit boundary. Beginning in 2005, around the time when

dewatering activities began at the pit, ponding areas appear immediately adjacent to and within the permit boundary. Until recently the Operator had been directing their pit dewatering discharge to the LDC. These ponding areas have developed over time and persist to what is currently seen at the site. The Division believes that dewatering at the site has caused these ponding areas due to the Operator's discharge into a low gradient surface water flow regime unaccustomed to the increased flows. Additionally, in Figure 7 the modeled increase in groundwater adjacent to the permit boundary in this area of ponding is approximately 4 feet. The Division believes there is a possibility that the ponding water may actually be groundwater exposed at the surface along with surface water. Please comment.

5. Observations and inferences, item 8, states the LGE lined pits to the south have caused approximately 3 to 4 feet of groundwater decline on the east side of the NCCI south pit. A review of the water levels associated with MW-4Z, -5Z and -6Z all show an increase in overall levels since 2020. Please comment on the increase in levels seen within these wells.

6. Observations and inferences, item 9, states the NCCI south pit liner will only create a one foot rise in groundwater levels on the west side of the pit. However, in Figure 7 there is a 3 to 4 foot modeled increase in groundwater levels, please clarify this discrepancy.

7. Discussions, on page 5 of 35, last sentence of the first paragraph states installing the underdrain could be perceived as a greater problem. Why?

8. Recommendations, on page 5 of 35, the Division believes these recommendations are not accurate given current site observations and need to be revised. Please revise the recommendations.

9. Impact Summary, page 9 of 35, the Division does not believe the mounding being caused by the NCCI South Pit is being cancelled out by the shadowing effects of the LGE pits. Did the model take into account any potential mounding and shadowing mitigation measures being implemented at the LGE pits?

10. Summer Water Table Baseline Run, page 10 of 35, the model was calibrated using groundwater elevations collected from MW-Z1 and MW-Z2 in July 2019 and that level is 4861 feet. A review of the groundwater level data provided, looking at measurements from the months June, July, and August between 2010 and 2019 indicates the average groundwater elevations to be approximately 4862.4 feet which is 1.4 feet higher than what the model was calibrated to. Additionally, the groundwater data provided to the Division indicates that there were no groundwater level data was collected in July 2019. Please provide a detailed explanation of what the impacts would be to the model using a more representative higher groundwater elevation for calibration.

Of the data collected during the three months above (June, July, and Aug) between 2010 and 2019 the average groundwater elevation was 4862.44 feet, minimum elevation was 4859.35 feet and the maximum was 4866.38 feet. All this collected data has been obtained while the pit(s) were actively being dewatering therefore the data is believed to biased low. Why is it appropriate to calibrate a model using potentially depressed groundwater elevations due to pit dewatering?

11. Figures 9 and 10 need additional clarification. Both Figures are stated to be calibrated to July 2019 groundwater elevations, however the 4861 contour does not appear to correctly placed in Figure 9 and the contours do not match with the observed groundwater elevations in Figure 10 (e.g. the 4861 contour should intersect with MW-Z1 and MW-Z2 and it does not).

12. April 2022 to July 2022 there is a sudden increase in groundwater elevations across the site, please explain what occurred at the site that accounts for the sudden increase.

13. A review of the groundwater elevations for MW-Z1 and MW-Z2 for 2023 shows that groundwater elevations came within one foot of the ground surface. Prior to June 2022 the average depth from ground surface to groundwater was 9.2 feet. The Division believes the Operator is no longer minimizing disturbances to the hydrologic balance pursuant to Rule 3.1.6. The Operator shall within 60 days of the date of this letter submit a Technical Revision detailing what mitigation measures (e.g. French Drain) will be implemented to address groundwater mounding in the area, construction schedule for installation, and a new groundwater model demonstrating the effectiveness of the proposed mitigation measures.

If you need additional information or have any questions, please let me know.

Sincerely,

Patrick Lennberg
Environmental Protection Specialist

cc: Jared Ebert, DRMS