June 1st, 2022

Mr. Eric Leigh
Monarch Mountain Minerals and Aggregates, LLC.
5 Concourse Parkway, Suite 1900
Atlanta, GA 30328

RE: Monarch DENM Gravel Mine – Mitigation Plan for Potential Groundwater Impacts

Dear Mr. Leigh

The purpose of this memo is to describe the existing groundwater regime in the vicinity of the Monarch DENM gravel mine including the potential groundwater impacts of the new soil-bentonite slurry wall(slurry wall) installations and wet mining of the Siltation and Freshwater Ponds. The Monarch DENM The site is located west of Highway 60, north of Weld County Road 40.5, and east and south of the South Platte River. It encompasses 545.90 acres (plus or minus) and consists of four slurry wall lined pits, an unlined Siltation Pond, and two Fresh Water Ponds. More specifically, the site is within parts of Section 18, 19 and 30, Township 4 North, Range 66 West, 6th P.M., County of Weld, State of Colorado. The site is approximately 550' south east of the South Platte River at its closest point. Land uses in the area include irrigated agricultural, oil and gas production, active gravel mines, mines reclaimed as below grade reservoirs, and low-density residential housing.

The Monarch DENM site will be mined in 5 phases comprising 7 cells. Phase 1 will consist of 2 unlined cells referred to as the freshwater pond and the siltation pond. The siltation pond will receive wash fines from the processing of mined sand and gravel. Phase 2 will be lined with a slurry wall and will contain Cell 1. Phase 3 will be lined with a slurry wall and will contain Cell 2. Phase 4 will be lined with a slurry wall and will contain Cell 3. Phase 5 will consist of 1 unlined Fresh Water Pond and a slurry wall lined Cell 4.

Existing Groundwater Conditions

The near surface groundwater is part of an alluvial aquifer in which permeable sand and gravel alluvium overlies relatively impermeable bedrock of the Denver Formation. Groundwater, measured in 7 piezometers, occurs at depths usually ranging from 4.6' to 29.3' feet with shallower groundwater to the north of the site. The prevailing groundwater flow at the site is to the north west reflecting the site topography. Groundwater in the area is tributary to the South Platte River located north of the site. Locally the groundwater levels and flow directions are likely influenced by:

- The South Platte River is north and west of the site. For most of the year, the river likely acts as a drainage way maintaining groundwater levels at elevations greater than water elevations in the river. In shorter periods of high run off, usually in the spring, river water levels will locally recharge the groundwater table.
- An unnamed slough runs between the South Platte River and the site. The slough likely acts as a drainage way maintaining groundwater elevations greater than water elevations in the slough.

- The Western Mutual Ditch traverses the southern portion property from west to east between Cell 1 and Cell 2 and then follows the east permit boundary until it flows underneath County Road 25.5. The ditch may act like a drain during the non-irrigation season maintaining water levels at or above the water levels in the ditch. During the irrigation season, the ditch may serve as a source of recharge to the water table.

- There are four (4) small pivot ponds at the site. These ponds likely cause elevated groundwater levels at the site during the irrigation season.

- Irrigation: The site is located in an area of irrigated cropland. Applied irrigation that is not lost to evaporation and transpiration likely recharges the groundwater.

- Alluvial wells: Other than the five monitoring wells drilled at the site for monitoring groundwater levels, there are also eight pumping wells permitted within 600 feet of the mine property. There are three wells north of the site, three wells east of the site, one well south of the site and one well west of the site. If pumping, groundwater will be drawn to these wells.

Potential Slurry Wall and Mining Impacts to Local Groundwater Levels

For all lined cells, a properly constructed slurry wall will tend to isolate these cells from the surrounding alluvial groundwater table. The liner around these cells could cause "mounding" of groundwater (increase in groundwater elevation) on the upgradient side (south and southeast) of the lined cells and a potential "shadow effect" (reduction in groundwater level) on the downgradient side (north and northwest) of the mine. Because the liner will tend to isolate these cells from the surrounding groundwater table, the effects of dewatering when mining lined cells will tend to not extend beyond the liner.

Any mounding effect on the upgradient side of the site (south and southwest) is anticipated to be on the order of a few feet or less and will dissipate with distance from the mine. Similarly, shadowing effects will be on the order of a few feet and will dissipate with distance from the mine. The shadowing effects will be minimized by the presence of the South Platte River to the northwest.

Dewatering of the unlined cells (Siltation Pond, and Freshwater Ponds) will result in decreases in water levels around these cells.

Area Wells

A review of the permitted wells on file with the State Engineer's Office (SEO), Division of Water Resources (DWR) indicates that there are eight permitted pumping wells within 600 feet of the permit boundary. All of these wells are screened in the alluvium. Three of these wells are located within 600 feet of the unlined cells (south Fresh Water Pond, Siltation Pond and North Fresh Water Pond).

Wells within 600 feet of the permit boundary(not owned by the site property owner) are discussed below:

- Carrol Sorrell Well 12462-R-R: This well is northeast of the plant area and is cross-gradient from the site. It is not expected to see a rise or fall due to the mine.
- Richard Karbowski Well 216684—8: This well is located between the north Freshwater Pond and the Siltation Pond. During mining of the North Freshwater Pond and Siltation Pond this well may see some drawdown due to the dewatering process. A monitoring well was installed approximately 250 feet to the west in order to monitor the effects of dewatering on the Karbowski well.
- Red Tierra Equities LLC Well 13689-R-R: This well is approximately 350 feet east of the Siltation Pond and may see some drawdown during dewatering of the Siltation Pond.
- United Water and Sanitation District Well 14028-R: This well is located approximately 365' southeast of the southern Fresh Water Pond. This well is upgradient from the unlined Fresh Water Pond and may see some drawdown during dewatering operations.
- Gerald Moran Well 187426—A: This well is located approximately 220 feet southeast and upgradient from the slurry wall lined Cell 2 and north of the Western Mutual Ditch. This well may see a groundwater mounding effect from the Cell 2 slurry wall on the order of a couple feet.

- Allan Frank Well 206387-: This well is located approximately 520' south west of the slurry wall lined Cell 1. The well is cross-gradient from Cell 2 and it is not anticipated to see changes in groundwater table.
- Janice Frank Well 14042-R: This well is located approximately 520' south west of the slurry wall lined Cell 1. The well is cross-gradient from Cell 2 and it is not anticipated to see changes in groundwater table.
- Ben Gutfelder Well 1874250-: This well is located approximately 275 feet northwest and downgradient from Cell 2. The well may see a groundwater shadow effect from the Cell 2 slurry wall on the order of a couple of feet. The groundwater shadow effect will likely be mitigated by the wells proximity to the South Platte River.

Groundwater Level Monitoring and Mitigation Plan

Dewatering during mining of the Siltation Pond and Freshwater Pond is unlikely to affect any wells in the area. However, if the miner receives a complaint, the following mitigation plan will be implemented.

The site monitoring wells will be measured monthly to identify potential changes in alluvial groundwater flow or elevation associated with mining and reclamation activities. Baseline data collected from the monitoring program will provide a range of relative water levels associated with pre-mining groundwater conditions. Experience at other mines in similar geologic settings has found that groundwater levels tend to fluctuate being highest in the summer irrigation season and lowest in the winter and early spring.

If, during mining or reclamation, the relative seasonal groundwater elevation at any monitoring wells differs from baseline conditions by more than 2 feet, and the condition was not observed during baseline monitoring, or if the miner receives a complaint from any well owner within 600 feet of the site boundary, then the miner will evaluate the cause and take action within 7 days and notify the DRMS.

After the DRMS has been notified, the miner will review the data and available information and submit a report to the DRMS within 30 days. The evaluation will include discussions with the well owner who has contacted the miner regarding a concern and review of baseline data from the well and vicinity to evaluate whether changes may be due to seasonal variations, climate, mining, slurry wall lining or other factors. The report will identify the extent of potential or actual impacts associated with the changes. If the extent of groundwater changes due to mining or reclamation activities is determined to be a significant contributing factor that has or may create adverse impacts, the mining associated impacts will be addressed to the satisfaction of the DRMS.

Miner will begin implementing one or more mitigation measures if mining and reclamation activity is determined to be a significant factor to groundwater changes requiring mitigation.

Mitigation measures may include, but are not limited to:

- Placing water in a recharge pond to raise groundwater levels around the well.
- Constructing a local clay liner at the edge of the mine Cell (i.e. between the dewatering point and the well) in order to raise water levels on the well side of the liner and mitigate dewatering effects.
- Cleaning the well to improve efficiency.
- Providing an alternative source of water or purchasing additional water to support historic well use in terms of water quantity and quality. If needed, water quality parameters will be checked in affected wells to ensure alternative sources support historic use.
- Modifying a well to operate under lower groundwater conditions. This could include deepening the well or lowering pumps. All work would be done at the miner's expense with the exception of replacing equipment that was non-functional prior to mining.

Attachments:
Existing Conditions Map
Proposed Reclamation Map

J:\Quikrete - 282\Monarch DENM\DRMS\Correspondence\DRMS\Adequacy\Groundwater\Groundwater Monitoring Plan.doc