February 25, 2022
Via Electronic Mail

Mr. Brock Bowels
Colorado Division of Reclamation, Mining and Safety
1313 Sherman Street, Room 215
Denver, Colorado 80203

Subject: Home Office Mine, File No. M-1977-439
Amendment 4 (AM-4), Exhibit G Comments

Dear Mr. Bowels:

On behalf of Loveland Ready-Mix Concrete, Inc., Telesto Solutions, Inc., (Telesto) submits the enclosed comments on Martin Marietta Materials, Inc. (Martin Marietta) 112c Permit Amendment Application for their Home Office Mine. We appreciate the Colorado Division of Reclamation, Mining and Safety's (DRMS's or Division's) consideration in this matter.

LRM holds agricultural property to the north and east of Stage G, Phase 1 as described in the application materials and in particular, Exhibit G. Our main concern is the lack of groundwater analysis to support the claim that the proposed plan will maintain the hydrologic balance, no information related to the claim by adjacent landowners to the west of frequent summer flooding after construction of the Stage G, Phase 1 Pit, and the uncertainty posed by the plan on LRM's adjacent farm fields.

Based on documentation from the Division's laser fiche file, AM-4, and Google Earth historical aerial photography, our understanding of Martin Marietta's timeline in developing the Stage G pit is as follows:

- Groundwater level monitoring begins near future Stage G in 2015 (3 wells)
- Mining and associated dewatering began spring 2016 for Phase 1
- Between October 2017 and October 2018, dewatering and mining at Phase 2 begins
- Installation of HO-01 and HO-06 monitoring wells in May 2018
- Decommission recharge ponds (near Taft Hill Road) and establish new recharge pond (southeast side of Phase 2 pit) sometime between July 2019 and October 2020
- Reclamation of Phase 1 pit by October 2020 (confirmed by photos in inspection report July 2021)
- HO-11 through HO-14 installed May 2021

- Currently mining Phase 2

Specific comments and questions for Exhibit G follow:

SECTION 1–INTRODUCTION AND BACKGROUND

Paragraph 2 indicates that "*This Groundwater Monitoring and Mitigation Plan presents the methods for monitoring groundwater during mining and reclamation, and for mitigating any potential groundwater impacts associated with permitted mining at the site.*" How can monitoring of groundwater during mining and reclamation be completed when monitoring wells were not installed between LRM's property and the Phase 1 pit until after reclamation was complete?

Paragraph 3 states that the discussion is limited to potential changes in the hydrologic balance resulting from the installation of the compacted clay liners. The paragraph refers to Figure G-1, which shows conceptual groundwater flow directions before mining and after reclamation. The focus of the paragraph and Exhibit G is on Stage G, yet the Stage G area is confined to the northeast corner of Figure G-1. It should be central to the figure to show areas surrounding the pit. With lined pits, the potential disruption to the hydrologic balance is "mounding" upgradient of the lined area and "shadow" of the down-gradient areas. Please provide projections of the anticipated changes up- (especially to the north) and down-gradient of the pit area. Also,

- What is the basis of the green flow arrows?
- How do you depict groundwater flow directions (they may be correct) without a potentiometric surface?
- Why are there no projections of the pre-pit groundwater flows through the pit area and to the north?
- Where does the water from the north go?
- How large will the mounding be on the north side of the Phase 1 pit?

SECTION 1.1–HISTORICAL USE

From our understanding of the timeline and information from site inspections, it appears that Phase 1 is complete with liner installed. It is unclear from the section title if Martin-Marietta plans to go back in and install liner over what appears to be a reclaimed and final Phase 1 (See photographs in July 2021 inspection report). What is the timeframe for installing liners and perimeter drains?

This section identifies a potential issue with rising water table west of Stage G, and points to Section 2.1 for the mitigation solution. There are no analyses in Section 2.1 confirming the reason for the issue, or the solution. Please provide such analyses.

SECTION 1.2

The first paragraph describes monitoring wells installed in 2005. Which wells are these? Where are they located? Where are the data? These would be very useful in helping LRM understand potential impacts. Please provide a plan view map of their locations and historical data.

Groundwater elevations shown in Charts 1, 2 and 3 are helpful when combined with the location map to help understand groundwater gradients, but do little to explain how close the groundwater is to ground surface, and what the potential impacts could be to landowners. Please provide depth to water information for these wells.

Chart 1 shows a steep rise that correlates in time to the end of mining in Phase 1. There is almost a 7.25 foot between July 2020 and July 2021 in well HO-01, and the trend is upward. What is the cause of this? Will the trend continue upward? This could be an issue for LRM's ability to farm the field to the north of Phase 1. Could it explain the issue raised by the neighbor?

SECTION 2.1

This is the paragraph referred by Section 1.1 as mitigation for the observed rising water table west and north of Stage G Phases 1 and 2, respectively. The paragraph references a perimeter drain being designed by Deere and Ault. Anecdotal information from neighbors indicate that Martin Marietta already installed the drain. Given the rising water level in HO-01 and the fact that Martin Marietta is actively dewatering Phase 2 (and thus, lowering the head at the drain outlet creating a large gradient to increase flows), does not bode well for the mitigation solution purposed in the document. Please explain how this is a mitigation solution for rising water levels on the north side of the Phase 1 pit, and how LRM is protected from flooding caused by groundwater rising to flow around the pit liner.

It is not clear whether the "underdrain" shown in Figure F-3 is the "perimeter drain," or if another drain is planned. Please provide design details (or as-built drawings) for the perimeter drain. Include:

- Plan and profile along the proposed alignment
- An effective hydraulic conductivity analysis
- Hydraulic analysis

These should show the combination of the perimeter drain and liner is equivalent to the pre-mining condition in terms of its carrying capacity. Also, include the area north of the Phase 1 pit in this analysis to show the potential impact to LRM property.

The plan view on Figure F3 labels an "underdrain" perforated pipe skirting the west side of the Phase 1 pit, passing between Phases 1 and 2, turning solid and emptying into the recharge pond on the southeast side of Phase 2. The perforated drainpipe and trench bottom are roughly 5.4 and 6.4 feet, respectively, below the top of the liner, which is essentially at natural grade. Based on water levels taken on LRM's property, the bottom of the drain might intersect the top of the natural water table, and thus, it appears the drains are not planned deep enough. It is our experience that French drains that extend over at least half of the saturated thickness are necessary to efficiently move groundwater around impermeable structures. Please provide an analysis regarding the drain sizing, depth, and location (horizontal and vertical) that efficiently and effectively moves groundwater around the lined pit on all sides and maintains the hydrologic balance. Related, provide methods and infrastructure design to maintain (e.g., cleanouts) and ensure the drain has a long life.

SECTION 2.3

The mitigation plan is reactive: 1) wait for complaints by neighboring well owners, and 2) then rely on baseline data to determine if there is an effect and develop a mitigation strategy. There is no up-front planning presented to provide an inkling that a workable plan is in place to maintain the hydrologic balance. Please ensure the plan is proactive by providing projections of problem areas, and potential mitigation strategies before something happens.

Mitigation in this section talks solely about impacts to wells. Please elaborate on the mitigation strategy for flooding neighboring properties (e.g,, eliminating problematic groundwater in crawl spaces, saturating farm ground or crop root zones with a water table that is too high).

SUMMARY

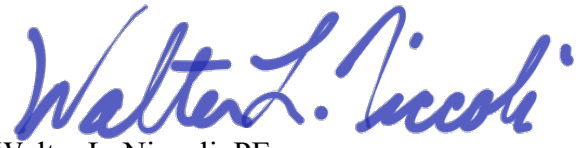
To ensure the applicant's amendment meets the requirement to maintain the hydrologic balance and not harm LRM's (and neighbor's) properties, LRM humbly requests that the DRMS requires the applicant to be pro-active in revision to the current AM-4 submittal, and provide the requested analyses, engineering plans, clarifications, and address the questions raised in this review, particularly:

- Clarifying the timing of mining, lining and perimeter drain installation
- Providing baseline information from the monitoring wells installed in 2005
- Providing elevational information and/or depth to groundwater information when presenting all monitoring well information

- Describe the observed trends in groundwater elevations, their estimated causes, and considerations for the proposed reclamation plan to maintain the hydrologic balance
- Providing detailed analysis on the function of the proposed drain and liner combination
- Show and justify projected groundwater levels after reclamation including how the perimeter drain will function efficiently long-term
- Extend the perimeter drain to include the north side of Phase 1 and include appropriate discharge

We appreciate your time and consideration of these comments, questions, and suggestions. If you have any questions, or need clarification on any information presented herein, please do not hesitate to contact me at the numbers in the letterhead or via email at wniccoli@telesto-inc.com.

Sincerely,
Telesto Solutions, Inc.



Walter L. Niccoli, PE
Principal/Senior Engineer

WLN:sfe
Enclosure
cc: