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

December 7, 2021

David Bieber
Front Range Aggregates, LLC
c/o Martin Marietta Materials, Inc.
1627 Cole Boulelvard, Suite 200
Lakewood, CO 80401

Re: Parkdale Quarry, Permit No. M-1997-054; Third Adequacy Review for 112 Construction Materials Reclamation Permit Amendment Application (AM-02)

Dear Mr. Bieber:

The Division of Reclamation, Mining and Safety (DRMS) has completed its review of your responses (received November 17 and 29, 2021) to our October 22, 2021 second adequacy review (SAR) of your 112 Construction Materials Reclamation Permit Amendment Application (AM-02) for the Parkdale Quarry, Permit No. M-1997-054. **The current decision date for this application is December 17, 2021**. Please be advised that if you are unable to satisfactorily address any concerns identified in this review before the decision date, **it will be your responsibility to request an extension of the review period.** If there are outstanding issues that have not been adequately addressed prior to the end of the review period, and no extension has been requested, the DRMS may deny this application.

The following items must be addressed by the applicant in order to satisfy the requirements of C.R.S. 34-32.5-101 et seq. and the Mineral Rules and Regulations of the Mined Land Reclamation Board (*Items previously deemed adequate have been removed and the original comment numbers have been retained for tracking purposes*):

6.4.3 EXHIBIT C - Pre-mining and Mining Plan Map(s) of Affected Lands

5. Overburden and Topsoil Stockpiles: The response is adequate.

6.4.4 EXHIBIT D – Mining Plan

9. Conveyor System: The DRMS accepts your commitment to submit a technical revision addressing the demolition and reclamation costs for the proposed conveyor system at least 30 days prior to constructing the conveyor system. The response is adequate.

13. Bench Design: The response is adequate.

6.4.5 EXHIBIT E – Reclamation Plan

17. Valley Floor Drainage Channels: The response is adequate:

a. Hydrologic and hydraulic analyses for channel design: The DRMS accepts your commitment to submit a technical revision addressing the final design for the engineered channel cross-sections and geomorphological drainage layout prior to initiating mining in each of Phases 1 through 5.

20. Reclamation Performance Standards: The response is adequate.

6.4.6 EXHIBIT G – Water Information

23. Groundwater: The DRMS has the following comments based on the revised Exhibit G submitted on November 16, 2021.

A. General Comments:

i. Surface water monitoring locations on Currant Creek and Tallahassee Creeks are inconsistently named with respect to upstream and downstream locations. In order to avoid future potential confusion, please rename/renumber the locations such that they consistently increase in the downstream direction.

ii. Please provide a basis for the "apparent" groundwater flow directions shown in Figure 5. (*Based on our December 6, 2021 telephone call the DRMS understands the flow direction is based on both well data and surface topography. Perhaps this should be titled "assumed" and stated as based on surface topography*).

iii. Any changes made to the contents of Tables 7 through 10 should be accurately reflected in the text of the plan where necessary.

B. Table 7 Comments:

i. Title contains statement "(Reported Levels are Totals verses Soluble)" Why? All metals are specified as dissolved concentrations – which is appropriate.

ii. Why is there a superscript "4" by all well names? This doesn't seem to correlate with the footnotes for the table.

iii. Chromium values should be specified as "all forms" to indicate that the value shown is a combined total of trivalent and hexavalent forms as specified by Reg 41, not "total" which would imply that the data is for a total metals analysis, not dissolved metals. (*This comment also applies to Table 9*)

iv. Standards shown for Mn and Se are incorrect: Mn=0.05mg/l, Se=0.02mg/l. This (*This comment also applies to Table 9*)

v. Standard for U should also show the MCL for U of 0.03mg/l, this range should be appropriately footnoted as in Reg 41. (*This comment also applies to Table 9*)

vi. Please acknowledge (in the footnotes) that the analyte list in Table 7 for historic data is missing several required parameters from Table 9.

vii. The way the Radionuclide data is presented and footnoted is very confusing:

a) Text in footnotes 4 and 5 seems to conflict

b) Perhaps 2 lines for "adjusted gross alpha" would be more appropriate – one that is adjusted as needed to compare to the standard shown – footnote as needed

c) Perhaps a "total radium" line would also be useful for comparison to the standard in footnote 5

C. Table 8 Comment: Third column: Monitoring frequency for all field parameters and analytes shall be quarterly for all locations unless approved by DRMS in a future TR.

D. Table 9 Comments:

i. Table would be more appropriately titled Surface and Groundwater Monitoring Parameters and Applicable Standards.

ii. Why are field parameters being collected from the on-site springs and who will this data be reported to? It doesn't appear that there are any applicable standards, and these springs are stated to be eliminated by future mining activity.

iii. Point of Compliance (POC) locations vs. internal or background locations can be identified in footnotes and text – separate columns in this table are not necessary. This may allow the table to be simplified to consist of only surface water, and groundwater columns (maybe springs?).

iv. It can also be specified in text or footnotes that applicable standards are only applied to POC sampling locations for enforcement purposes.

v. Why is Cu specified as dissolved and in micrograms/l for Surface Water Quality Discharge Std.? Please also explain 30 day vs. maximum daily average for this standard and how this data is obtained.

vi. Why are some Surface Water Quality Standards shown as TVS or TVS/WS and not numeric standards? Are these hardness based standards, and if so, how are they calculated and reported?

vii. See Table 7 comments above (7.B.iii, iv and v) for Cr, Mn, Se and U groundwater standards.

viii. Incorrect groundwater standards are also given for Cu, and Ag.. Cu=0.2 mg/l, Ag=0.05mg/l

ix. Fluoride should be included in the groundwater analyte list (for at least background sampling) if concentrations are elevated pre-mining that will be very helpful to know. Standard is 2 mg/l (Agricultural)

x. Footnote notations for Adjusted Gross Alpha and Gross Beta do not match notes text following Table 9

E. Table 10 Comment: Table 10 includes potential impacts to water quality and quantity of off-site springs, and states that a determination of impact may be based on 5 quarters of monitoring data compared to baseline values. However, these off site springs are not identified or included in any of the discussed monitoring and sampling for the site in this

plan – either to determine baseline, or for ongoing quarterly monitoring. Please clarify, provide data, and locations.

6.4.12 EXHIBIT L – Reclamation Costs

25. Seeding: The response is adequate.

29. Clay liner fill: The response is adequate.

32. DRMS Estimate: The DRMS is in the process of generating a reclamation cost estimate based on this amendment application and responses to this and the previous adequacy review letters. A copy will be provided to you for review. No response is necessary.

6.5 GEOTECHNICAL STABILITY EXHIBIT

34. Geotechnical Stability Exhibit: The DRMS has the following comments based on the Rule 6.5 Geotechnical Stability Exhibit dated November 15, 2021 submitted on November 17, 2021:

    A. Stereonet Plot approach to stability evaluation: For the record, please clarify and elaborate on the approach using stereonet plots to demonstrate stability. The narrative should separate assumptions (intact rock mass vs. joint strength, etc.) and rationale (e.g., how observed joint spacing and length constrain potential failures, etc.) for reclamation slopes (global failures) from bench slopes (local failures); describe how Table 1 data is represented on Figures 2A through 4; explain the difference between shaded and unshaded zones on Figures 5 – 26; describe the significance of the plotted points (poles) relative to their positions (e.g., unlikely sliding and toppling failures vs. potential block, slab and wedge failures) on the stereonet plots relative to shaded and unshaded areas; and elaborate on how this approach meets the intent of MLRB Policy No. 30, given the approach differs from the more conventional Factor of Safety approach.

    B. RockPack III results: The bottom of p. 6 states RockPack III was used for stability analyses, followed by rock properties used in the software on the top of p. 7. The first paragraph on p. 8 summarizes the factors of safety found for multiple configurations of slopes, but no modelling results are included in the submittal. Please provide the model results referenced on the top of p. 8.

    C. Blasting Plan: The following required elements for the DRMS to approve a blasting plan were not included:

        i. Limits on ground vibration (i.e., peak particle velocity),
        ii. Limits on air blast (i.e., peak air pressure),
        iii. Locations where blasting monitoring instruments are/will be set up,
        iv. Commitment to generating and filing a blast report.

    Please provide proposed blast monitoring limits, a map locating blast monitoring locations, and designate who generates and files the blast report.

Please remember that the decision date for this application is December 17, 2021. As previously mentioned if you are unable to provide satisfactory responses to any inadequacies prior to this date,

it will be your responsibility to request an extension of time to allow for continued review of this application. If there are still unresolved issues when the decision date arrives and no extension has been requested, the application may be denied. If you have any questions, please contact me at (303) 328-5229.

Sincerely,

Timothy A. Cazier, P.E.
Environmental Protection Specialist

ec: Michael Cunningham, DRMS
Eric Scott, DRMS
DRMS file
Stephanie Carter, BLM