COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources
1313 Sherman Street, Room 215
Denver, Colorado 80203

October 21, 2022

Bill Tezak
Colorado Quarries, Inc
270 South 15th St
Canon City CO 81212

Re: Fourth Adequacy Review of a 110 to 112 Construction Materials Reclamation Permit Conversion Application Package CN1, Black Obsidian Pit, Permit M1987-026

Mr. Tezak:

The Division of Reclamation, Mining, and Safety has completed its Fourth adequacy review of your 110 to 112 construction materials reclamation permit conversion application. The application was called complete for review on August 2, 2021. All comment and review periods began on August 2, 2021. **The decision date for this application was previously extended by the MLRB to October 31, 2022.** The review consisted of comparing the application content with specific requirements of Rule 6.1, 6.2, 6.4 and 6.5 of the Minerals Rules and Regulations of the Colorado Mined Land Reclamation Board for the Extraction of Construction Materials.

Please be advised that if you are unable to satisfactorily address all concerns identified in this review before the decision date, this revision will be denied and you will be required to resubmit all CN materials as a new application for approval.

Please note that any changes or additions to the application on file in our office must also be reflected in the public review copy, which has been placed with the Custer County Clerk and Recorder.

EXHIBIT D - Mining Plan (Rule 6.4.4): The mining plan shall supply the following information, correlated with the affected lands, map(s) and timetables: ***Please review, consolidate, and update as needed the information provided by the initial submittal and all adequacy responses to-date.***

(a) Provide a description of the method(s) of mining to be employed in each stage of the operation as related to any surface disturbance on affected lands; ***What is the proposed configuration of the benches to be created within the expanded mine area (feet wide by feet high)?***

Rule 3.1.10(3) states "If the Operator's choice of reclamation is for rangeland, the land shall be restored to slopes commensurate with the proposed land use and shall not be too steep to be traversed by livestock…"

DRMS normally requires an overall slope of no steeper than 3:1 for rangeland reclamation. A 3:1 slope is able to be traversed by livestock easily, and can typically be revegetated without issues of excessive erosion and slope stability.

Geotechnical stability analysis is also generally not required if slopes of 3H:1V or less are maintained during the mining and reclamation process. DRMS may approve steeper mining and reclamation configuration if

sufficient geotechnical data are provided to demonstrate that the factors of safety as presented in MLRB Policy will be met, and that the resulting reclamation configuration will be stable.

This is generally provided in the form of a geotechnical stability analysis performed and stamped by a registered engineer. A copy of the complete policies of the MLRB is available on the DRMS website. The relevant section "30.0 -Factors of Safety for Slope Stability/Geotechnical Analysis" has previously been included as an attachment to the third adequacy letter.

For a final overall pit slope of no steeper than 3:1 the bench configuration should be a 30' wide bench with 10' high vertical faces or similar, or significant backfilling may be required to achieve acceptable final reclamation slopes. As previously stated, if the operator wishes to mine and reclaim to a steeper configuration (higher high-walls, thinner benches) a geotechnical evaluation of the proposed bench configuration should be provided to demonstrate that the proposed final benches will be result in a stable reclamation.

The following issues were identified with the most recent Geotechnical Stability Analyses provided to the Division to-date. Please address the issues listed below:

1) The DRMS acknowledges the unique challenges associated with geotechnical evaluations and analyses for obsidian. However, a demonstration meeting the intent of MLRB Policy 30 must be provided. It should be noted that DRMS is concerned with potential offsite impacts during operation and long term global stability and local safety/stability at closure/final reclamation.

2) Given the unique circumstances, the DRMS requires a commitment to have a geotechnical inspection performed annually by a qualified, licensed professional assessing the stability of the highwall(s) and submitting their evaluation/assessment in a report along with the permit's annual report.
The recent submittal provides a generally adequate executive summary, but lacks detailed analyses to support the stated conclusions. Please acknowledge and commit to providing this geotechnical stability inspection by a qualified, licensed professional with the annual report for this site.

3) The provided exhibit states Bishop's Method of Slices is inapplicable without any rationale. The DRMS acknowledges Bishop's method is generally associated with circular failures, but other methods are applicable for polygonal slip surfaces (e.g., Sarma, Spencer and Morgenstern-Price). Please provide some rationale as to why none of these approaches may be appropriate and propose an alternative method of demonstrating compliance with Policy 30.

4) The DRMS has recently accepted kinematic analyses in conjunction with slope stability evaluations (e.g. M-1997-054/Parkdale AM-2; M-1973-021/Morrison Quarry AM-7 ; M-1974-004/Spec Agg AM-4; and M-1977-141/Lyons Quarry TR-5). These have also included factors of safety analyses addressing global stability and rockfall/bench catchment capacity to demonstrate local slope safety upon closure. Please provide a demonstration of global stability and adequate bench catchment capacity.

5) Backbreaks and nodule stability. Sections 3 and 4 of the provided analysis assume a worst case 8-foot nodule is encountered in the highwall, stating that when 3 feet is exposed/protruding from the highwall, it should be removed. The DRMS is concerned a 5 or six foot nodule, which is likely just as hazardous, would fail by the time three feet of the nodule is exposed. Please revise this approach to the more generic 40 percent exposed nodule, for those as small as say one foot.

6) Please provide rationale, sources for any published or tested strength parameters, and limitations to any selected methods and analyses.

This concludes the Division's fourth adequacy review of this application. This letter shall not be construed to mean that there are no other technical deficiencies in your application. Other issues may arise as additional information is supplied. Please remember that the decision date for this conversion application is currently **October 31, 2022.** As previously mentioned, if there are still unresolved issues when the decision date arrives the application will be denied. If you have any questions, please contact me at (303) 229-9414, or at Eric.Scott@state.co.us .

Sincerely,

Eric Scott – Environmental Protection Specialist

CC: Ben Langenfeld via email