



LAC

LAC MINERALS (USA) LLC

June 2, 2023

Carmen Rose

Sr. Reclamation Specialist
Mining and Minerals Division
Mining Act Reclamation Program
1220 S. St. Francis Drive
Santa Fe, NM 87505

RE: Response to Agency Comments on the Application for Revision 20-1, Pit Wall Slope Stability Analysis Work Plan, Cunningham Hill Mine, Permit No. SF200RE

Dear Ms. Rose,

As required in your May 4, 2023, email communication, LAC Minerals (USA) LLC (LAC) hereby provides the attached response to comments on the Cunningham Hill Pit Slope Stability Analysis Proposed Work Plan prepared by Call & Nicholas, Inc. (CNI) to the New Mexico Mining and Minerals Division (MMD).

Additionally, to address MMD comments 1 & 2 entitled *Data Review*, LAC has retrieved all available documents related to Cunningham Hill Pit performance and drilling programs from remote long-term physical storage. These documents will be made available to CNI for review.

If you have questions or comments, please contact me at (775) 934-1766 or eburch@barrick.com.

Sincerely,

Eric Burch

Eric Burch
Project Manager

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2023-05-08

Mr. Eric Burch
LAC Minerals (USA) LLC
Cunningham Hill Mine Reclamation Project
582 County Road #55
Cerrillos, NM 87010

RE: Cunningham Hill Pit Slope Stability Analysis Proposed Work Plan MMD Commentary Response

Dear Mr. Burch,

Call & Nicholas, Inc. (CNI) has prepared these responses to the New Mexico Mining and Minerals Division (MMD) communication *Agency Comments on the Amendment to Application for Revision 20-1, Pit Wall Slope Stability Work Plan, Cunningham Hill Mine, Permit No. SF002Re* at the request of Mr. Eric Burch of LAC Minerals (USA) LLC (LAC). Agency comments have been reproduced below with CNI responses shown in blue.

1. *Data Review.* Does LAC have documentation of past mine slope performance over the life of the mine that can be reviewed?

To be addressed by LAC.

2. *Data Review.* Does LAC have discontinuity information obtained from past drilling programs available for review?

To be addressed by LAC.

3. *Site Visit.* MMD is concerned that a one-day site assessment by a single staff member does not budget enough time for safety and a proper field evaluation, especially if this assessment is performed concurrently with the drone flight. Is the drone crew separate from the geotechnical investigation crew? Please provide discussion on how the site assessments will adequately describe the performance of the slopes over time.

Two CNI staff members will conduct the assessment: one to conduct the on-the-ground geotechnical evaluation and a second to manage the drone flight.

Performance of the slopes over time will be evidence based and comparative with details from the 1994 CNI Slope Stability Memo, the 1995 geology map, and the 2017 topographic map acting as the historical baseline. Current slope conditions will be

described during the field visit, including notation of rockfall, cracking, slumping, or erosion of multiple benches. Slope performance after decades of rainfall, snow, and freeze-thaw cycles can be used as an indicator of future stability.

4. *Site Visit.* Field measurements should include mapping the pit walls to characterize the orientation, distribution, and condition of critical discontinuities, especially of discontinuities dipping into the pit. Past signs of slope failure and rock loosening also need to be noted.

CNI agrees with this comment, critical discontinuities will be mapped during the field visit. Features previously mapped will be reevaluated if necessary.

5. *Site Visit.* Much of the mine pit is inaccessible to the ground crew, and the engineering geologist will be unable to examine discontinuities directly in these areas. Please confirm that the drone flight will include collecting imagery in the vertical z-dimension of the pit to identify critical discontinuities in these areas.

Confirmed, CNI will use photogrammetry of the drone images to create a true-orientation, true-color, scaled 3D point cloud of the pit. Discontinuities located in unreachable areas or in unfavorable orientations for field mapping can be mapped from the point cloud.

6. *Drone Data Processing.* A topographic map should be developed to assist in creating geometry profiles for slope stability analysis, and for creating a baseline topographic map to compare future mine slope performance.

Topographic data derived from the 3D point cloud will be used to construct the Slide2 geometry and can be used as a comparative base against future surveys.

7. *Slope Stability Analysis.* Please confirm the rock unit thicknesses and orientation will be developed using published geologic resources and field observations. Information from rock core data would also be useful. Does LAC have any rock core data available from previous mine exploration drilling programs?

The 1995 SR Maynard detailed geologic map will be the primary source of data for rock unit thicknesses, orientations, and extents. This will be supplemented by field observations.

8. *Slope Stability Analysis.* LAC states that no rock strength testing data is available. In the absence of this data, please list the published resources that will be used to estimate rock strength and any other material properties.

Field hardness tests of rock units will be used in conjunction with the ISRM “field estimates of uniaxial compressive strength” table (Hoek, 1994) to estimate compressive strengths for the 2D analysis.

9. *Slope Stability Analysis.* Please confirm the slope stability model will include the area of the mine below the existing pit lake. The effect of the acidic pit lake water on

discontinuities shall also be considered.

CNI will use the most recent topographic data available, however, a bathymetric survey is not planned for this project. The drone survey will not penetrate below the existing water level. It will, however, capture the current pit lake water elevation.

If no sub-pit lake topography exists an estimated pit wall angle, following the known pit surface, can be used in the 2D LE analysis.

10. *Slope Stability Analysis.* Please include applicable seismic considerations in the analysis.

The Slide2 limit equilibrium analysis will include runs with horizontal pseudostatic seismic loading of the slope. Local seismic data will be sourced from the USGS Conterminous Unified Hazard Database.

11. *Slope Stability Analysis.* MMD will require that LAC report Rocscience Slide2 results as an Appendix to the Technical Memo. Slide2 has a reporting function to create these reports. Rocscience reports should include model properties, geometry, and results.

CNI will include reports generated in Rocscience Slide2 with the requested properties, geometry, and results as an appendix to the memo.

Please let me know if you have any additional questions or comments that may arise from these responses. I can be contacted at the CNI office at (520) 670-9774 or at my email address below.

Best regards,

A handwritten signature in black ink, appearing to read 'S de Bruin', with a horizontal line extending to the right.

Sean M de Bruin
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sdebruin@cnicucson.com