



## COLORADO

Division of Reclamation,  
Mining and Safety

Department of Natural Resources

Date: June 19, 2020

To: Eric Scott

From: Tim Cazier, P.E.

RE: Ragsdale Reservoirs, DRMS File No. M-2020-007;  
Adequacy Review - June 5, 2020 Cannon Lands Slope Stability Technical  
Memorandum by Deere & Ault

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The Division of Reclamation, Mining and Safety (DRMS) engineering staff has reviewed the June 5, 2020 Cannon Lands Slope Stability Technical Memorandum by Deere & Ault. The following comments are posed to ensure adequate engineering analyses and design practices are implemented in adherence to the Mined Land Reclamation Board Policy (MLRB) No. 30 - Factors of Safety for Slope Stability/Geotechnical Analyses.

1. Factor of Safety Selection. The submitted analyses indicates the appropriate Factors of Safety (FoS) fall under the MLRB Policy No. 30 "Strength Measurements Resulting from Multiple Tests". However, the analyses use material strength parameters from a different site (Fort Lupton) based on similar gradations, liquid limits and plasticity indices. Furthermore, the last paragraph on page 2 specifically states "These values are based on decades of experience, published values for estimated Laramie bedrock strength parameters, and were refined (reduced) based on back calculations from a local displacement at the Fort Lupton Pit."; which is what the more robust FoS MLRB policy category "Generalized, Assumed, or Single Test Strength Measurements" is intended. Finally, none of the Fort Lupton material strength lab results were provided. As such, the DRMS cannot accept the submitted analyses as demonstrating compliance with MLRB Policy No. 30. There are two options for the Applicant:
  - a. Perform a site specific geotechnical investigation of the Cannon Lands materials to include multiple tests for the material in the various proposed pits to demonstrate appropriate strength parameters, or
  - b. Perform a more limited site specific geotechnical investigation of the Cannon Lands materials to include verification tests for samples of the various proposed pits to demonstrate appropriate strength parameters are consistent with the Fort Lupton data and provide the strength test results from the Fort Lupton site for DRMS review.
2. Seismic Evaluation. The selected earthquake recurrence interval for the pseudo-static analyses is the 50-year earthquake. This is a much more frequent event



with a lower magnitude and most likely less significant acceleration profile than what is typically proposed to the DRMS. The Applicant shall provide rationale for the selected 50-year earthquake event including risk assessment for an appropriate hazard classification, ground acceleration evaluation (i.e., peak or effective ground motion parameters), and duration.

#### SUMMARY

These comments are based on Rule 6.5 and MLRB Policy No. 30 which in aggregate compel the DRMS to approve designs that will protect off-site areas, structures and/or facilities with appropriate factors of safety.