COLORADO GEOLOGICAL SURVEY

1801 Moly Road
Golden, Colorado 80401

Karen Berry
State Geologist

June 21, 2019

Chris Neubecker
Planning Manager
Community Development, Town of Vail
75 South Frontage Road
Vail, CO 81657

Location:
S½ Section 2,
T5S, R80W of the 6th P.M.
39.6473, -106.3125

Subject: East Vail Housing – Rockfall Hazard Mitigation
Town of Vail, Eagle County, CO; CGS Unique No. EA-19-0007 (previously reviewed as EA-18-0002)

Dear Chris:

Colorado Geological Survey has reviewed the East Vail Housing proposed development plan, geologic hazard studies, and rockfall hazard mitigation plans. I understand the applicant proposes a 73-unit residential development on the north side of I-70, at the East Vail (Exit 181) interchange.

The available referral documents include:

- Development application narrative (May 28, 2019),
- Set of 11 civil plans (Alpine Engineering, Inc., February 21, 2019),
- Rockfall Hazard Study, East Vail Parcel (Cesare, Inc., June 29, 2017)
- Geologic Hazard Analysis, East Vail Parcel (Skyline Geoscience, February 12, 2019),
- East Vail Parcel Geologic Hazard Analysis – Review of Updated Site Plan (Skyline Geoscience, May 24, 2019)

CGS reviewed this site, and Cesare's June 19, 2017 Rockfall Hazard Study, at rezoning; comments were provided in letters dated September 18 and September 19, 2017.

Skyline's rockfall hazard analysis and recommendations are valid. The rockfall hazard mitigation berm shown on the civil plans appears to be consistent with Skyline's recommendations.

However, the proposed berm will require periodic and ongoing inspection, maintenance and possibly repairs to preserve its effectiveness. Maintenance may include cleaning out accumulated debris to maintain the design berm/catchment height on the upslope side. **CGS recommends that the Town require an inspection and maintenance plan for the rockfall hazard mitigation berm prior to final plat approval.** The plan should include an inspection schedule.

Debris flow, avalanche, landslide, and construction-related slope instability hazards. Skyline discusses debris flow, landslide, and construction-related landslide reactivation hazards, but does not provide specific recommendations. It is possible that the proposed rockfall berm could provide some protection from debris flow hazards, but this should be evaluated.

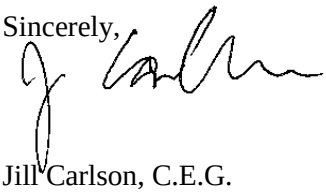
Two, possibly three "small avalanche" paths are located within the proposed Lot 1 area. Mears (CGS Special Publication 7, "Colorado Snow-Avalanche Area Studies and Guidelines for Avalanche-Hazard Planning) describes these as "not wide enough to be accurately displayed at the mapping scale of 1:24,000, so they are indicated as arrows. Although they appear small at this scale, they can also be very destructive."

CGS continues to recommend that the Town require completion of an avalanche hazard analysis and design of any necessary mitigation prior to final development plan approval to ensure that the proposed mitigation will provide adequate protection from avalanche hazards and can be maintained to ensure future performance. CGS recommends that any such hazard analysis and/or mitigation design be reviewed by the Colorado Avalanche Information Center.

Based on hillshade imagery derived from high resolution LiDAR data, proposed Building A appears to be located in the headscarp area of a small landslide located immediately west of the large landslide in proposed Tract A. Proposed Buildings E and F are also located within this smaller landslide. Skyline states (page 2 of the 5/24/2019 Review of Updated Site Plan) that slope stability and other geotechnical considerations are being addressed by Cesare this summer. CGS is available to review any additional geologic and geotechnical information and geologic hazard mitigation plans submitted for this project.

Thank you for the opportunity to review and comment on this project. If you have questions or require further review, please call me at (303) 384-2643, or e-mail carlson@mines.edu.

Sincerely,



Jill Carlson, C.E.G.
Engineering Geologist