Colorado Geological Survey comments for:
EP-24-0080 Crystal Park Site S-122 (AR) Site Plan
NW¼ NE¼ Section 18, T14S, R67W, 6th Meridian
38.8385, -104.9308

The referral documents included the Site Plan (LGA Studios, 9/5/2024), Geologic Hazard Study (Rocky Mountain Group (RMG), 5/17/2024), and Soils Report (A Better Soil Solution, 9/7/2023) for the proposed residence at 6881 Eagle Mountain Road.

Site S-122 does not contain rockfall hazards or mapped landslides but does contain steep slopes, up to 60 to 70 percent descending south and east, and 1041 hazard mapping describes these slopes as potentially unstable to unstable. Based on the site plan showing existing grades, it appears that the proposed residential structure will be located within the flatter area of the site (about 5 to 10 percent).

The site is underlain at variable depths by relatively loose material (commonly known as "Grus" or "Colluvium") weathered from the underlying Pikes Peak Granite. Pikes Peak Granite is typically not problematic from a geotechnical or foundation performance perspective. However, the rock is fractured and weathered, sometimes extensively. Both of these rock quality characteristics can impact slope stability and erosion potential. Additionally, Grus is weaker than the bedrock and can be highly variable in depth and highly susceptible to erosion.

RMG's characteristics of the geologic hazards and constraints and A Better Soil Solution's recommendations are valid. Provided RMG's and A Better Soil Solution's recommendations are strictly adhered to, **CGS has no objection to the site plan approval**. CGS offers the following comments and suggestions during the planning and development of this site.

1. As previously stated, the bedrock at the site is the Pikes Peak Granite, forming outcrops upslope of the project site. The existing rock outcrops should be examined and monitored before and during construction. Any loose rocks should be removed during construction.

2. CGS agrees with RMG that (p. 6) "The structural design of the residence should consider its placement on the hillside and the additional surface pressures that could be generated by downslope creep and by retaining upslope materials," and with their recommendation, "the foundation be designed with additional rigidity to help reduce the effect of potential lateral movement of subsurface soils." Also, RMG notes that the detached garage will be connected by an elevated breezeway spanning between the two separate foundations. CGS agrees with RMG's recommendation that the "additional rigidity design connect the two foundations below grade with tie beams or similar rigid elements."

3. CGS recommends that all planned cuts exceeding *four feet* in height be evaluated for slope stability using proposed slope geometry and considering all foundation and proposed cuts that will affect the slope. The geotechnical engineer should be provided with the construction plans and grading information to verify the proposed slopes.

4. Retaining walls, building foundations, and upslope foundation walls that will function as retaining walls must be designed by a qualified geotechnical, structural, or civil engineer and include adequate behind-wall drainage.

5. The site plan indicates a leach field (septic location) is planned northeast of the proposed residence. Engineered septic systems are commonly used in the Crystal Park area due to the steep slopes and geology.

Submitted 9/25/2024 by Amy Crandall, Engineering Geologist, Colorado Geological Survey (303-384-2632 or acrandall@mines.edu)