

COLORADO GEOLOGICAL SURVEY

1801 Moly Road
Golden, Colorado 80401



Matthew L. Morgan
State Geologist and Director

April 25, 2023

Daniel Sexton
Planning & Community Development
30 S. Nevada Ave, Suite 701
Colorado Springs, CO 80901

Location:
E½ Sec. 32, Section 33 & SW¼ Sec. 34
T14S, R64W of the 6th PM & NW¼ Sec. 3, 4
& E½ Sec. 5 T15S, R64W of the 6th PM
38.781°, -104.5649

Subject: Karman Line Land Use Plan AKA Norris Ranch, MAPN-23-0002
Colorado Springs, El Paso County, Colorado; CGS Unique No. EP-23-0068

Dear Daniel,

As requested, the Colorado Geological Survey (CGS) has reviewed the geologic hazard investigation for the Karman Line Land Use Plan. Pertinent documents for this referral included: City request for review (4.6.23), Geologic Hazard Study (Entech Engineering, Inc., 3.30.23), Hydrologic Assessment (HR Green Development, LLC, 4.3.23), Land Use Plan (HR Green Development, LLC, 4.4.23), and other documents. We understand that this project development will consist of ~1,783 acres of a mix of several types of residential, multi-use, commercial, retail, light industrial, public facilities, open space, and parks.

CGS has no objection to the proposed land use plan, provided the comments and recommendations from this letter are addressed in future development and grading plans, site investigations, and reports. Considering the size of the parcel of land, it is likely that not all geologic hazards and constraints to development have been identified. Future reviews by CGS may include additional comments about the conditions in more site-specific investigations.

Geologic hazard study. Entech's geologic hazard study discusses, identifies, and provides initial mitigation for geologic conditions within the Land Use Plan. CGS concurs in general with Entech's geologic interpretation. As noted on p. 1, Entech identified "areas of artificial fill, expansive soils, erosion, hydrocompaction, downslope creep, potentially unstable slopes, seasonal and potentially seasonal shallow groundwater areas, ponded water, floodplains, debris flow susceptible areas, and potential for high radon." Entech's *preliminary* recommendations should be adhered to during the preparation of future development and grading plans and preliminary/final plats.

Shallow groundwater and underdrains. Areas of shallow groundwater may be identified after more detailed investigations. Additionally, test holes were backfilled immediately following drilling operations. It would be prudent for future investigations to include groundwater monitoring/observation as groundwater in this area varies seasonally. CGS agrees with Entech (p. 12), "A minimum separation between foundation components and groundwater levels is recommended," and (p. 13), "Subsurface perimeter drains...underslab drains or interceptor drains may be necessary."

Potentially unstable slope areas. CGS concurs with Entech's recommendation (p. 11), "Building should be avoided on the potentially unstable slopes unless they are stabilized," and with their recommendation of "A

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minimum setback of 30 feet from the crest of these slopes.” CGS recommends that site-specific and detailed quantitative slope stability analysis be required to verify this setback as development plans progress.

Debris fans/debris flow susceptibility. Entech states (p. 14), “the potential for significant erosion and sediment laden flows originating along the heads of drainages in the northwestern portion of the site following significant precipitation events exist.” Setbacks from these drainages should be established along with site grading that establishes positive surface drainage and BMPs for stormwater. Additionally, setbacks should be established from the 100-year floodplain boundaries and mapped wetland areas. Setbacks should be noted on future development plans and preliminary/final plats.

Geologic Hazard Disclosure Statement. CGS recommends a geologic hazard disclosure statement to be added to future development plans that identify the geologic hazard report of record and lists the identified geologic hazards.

Thank you for the opportunity to review and comment on this project. If you have questions or require further review, please call me at 303-384-2632 or email acrandall@mines.edu.

Sincerely,



Amy Crandall, P.E.
Engineering Geologist