

GEOLOGIC HAZARD VALIDATION

**Rock Creek Mesa
Colorado Springs, Colorado**

PREPARED FOR:

**Rock Creek Residential LLC
90 S. Cascade Ave
Colorado Springs, CO 80903**

JOB NO. 201286

March 10, 2026

**Respectfully Submitted,
RMG Engineers**

**Reviewed by,
RMG Engineers**



**Kelli Zigler
Geotechnical Group Director**



**Tony Munger, P.E.
Sr. Geotechnical Proj Mgr | COO**

Project Description

The Rock Creek Mesa development lies in Section 30, Township 15 South, Range 65 West, of the 6th Principal Meridian in El Paso County, Colorado. The site consists of numerous parcels that are located immediately southwest of State Highway 115, accessed via Pawnee Road and Cherokee Drive. We understand the Rock Creek Mesa development is to consist of a mixed use of attached and detached single-family housing. At this time, it is uncertain if the units will be constructed atop crawlspace foundations or basement foundations. The site location and development plan have remained unchanged since the previous report was issued. Therefore, those figures have not been presented again in this report.

Access into the development will be from existing Pawnee Road and Cherokee Drive. Additional proposed land usage includes stormwater, detention areas, district tracts, utility easements and private roadways and driveways. Interior driveways and parking areas will most likely be privately owned. If public streets are developed, they will require a site-specific pavement design investigation and report. Individual wells and on-site wastewater treatment systems are not proposed.

Since the issuance of the original study, it has been proposed to annex the Rock Creek Mesa development from El Paso County into Colorado Springs, Colorado. The purpose of this report is to provide a validation of the previously-issued Geologic Hazard Study for approval of the annexed parcels for a zone change and eventually a Planned Unit Development (PUD) within Colorado Springs, Colorado.

Existing Site Conditions

The site currently consists of six parcels. The total acreage and buildable area of the proposed site is to be less than the gross area of the combined six parcels. Below is a list of the included parcels, as recorded on the El Paso County Assessors.

- **Schedule No. 6530400003** – currently addressed as 8145 Piute Road, contains 1.9 acres, and is zoned as “F-5” *Forestry and Recreation*;
- **Schedule No. 6530400013** – currently addressed as 285 Pawnee Road, contains 2 acres, and is zoned as “FS-5000” *Residential Suburban*;
- **Schedule No. 6530300017** – currently labeled as Pawnee Road, contains 9.47 acres, and is zoned as “R” – *Commercial Community, Forestry and Recreation*;
- **Schedule No. 6530300023** – currently labeled as Pawnee Road, contains 17.52 acres, and is zoned as “F-5” *Forestry and Recreation*;
- **Schedule No. 6530300026** – currently labeled as Pawnee Road, contains 9.96 acres, and is zoned as “R” – *Commercial Community, Forestry and Recreation*;
- **Schedule No. 6530300028** – currently labeled as Pawnee Road, 1.58 acres, and is zoned as “R” – *Commercial Community, Forestry and Recreation*;

The parcel is surrounded by a mix of residential uses ranging from a mobile home park to detached single-unit dwellings. It is our understanding the referenced parcels are to be annexed into the City of Colorado Springs.

Previous Studies and Field Investigation

Reports of previous geotechnical engineering/geologic investigations for this site were available for our review and are listed below:

1. *Soils and Geology Study, Rock Creek Mesa Proposed Development, El Paso County, Colorado*, prepared by RMG – Rocky Mountain Group, Job No. 179524, dated December 14, 2020.
2. *Geologic Hazard Study, Rock Creek Mesa, Colorado Springs, Colorado*, prepared by RMG – Rocky Mountain Group, Job No. 195372, last revised April 2, 2024.

The findings, conclusions and recommendations contained in those reports were considered during the preparation of this report.

As part of our review, we also reviewed the following documents:

1. Dames and Moore, 1985, *Colorado Springs Subsidence Investigation, State of Colorado Mined Land Reclamation*.
2. Federal Emergency Management Agency (FEMA), March 17, 1997, *Flood Insurance Rate Map, El Paso County, Colorado and Unincorporated Areas, Community Panel No. 081041C0506F*.
3. City of Colorado Springs, Colorado, *Map of Areas Susceptible to Differential Heave in Expansive, Steeply Dipping Bedrock*, by John Himmelreich, Jr. and David C. Noe.
4. Hillside Overlay Map, The City of Colorado Springs Map Viewer at: <https://gis.coloradosprings.gov/Html5Viewer/?viewer=springsview>
5. Colorado Geologic Survey, Colorado Springs Landslide Susceptibility, <https://cologeosurvey.maps.arcgis.com/apps/webappviewer/index.html?id=5e7484a637c4432e84f4f16d0af306d3>.

Based upon our review of these documents, the site:

- does **not** lie within a known area of underground mining;
- does **not** lie within the 100-year floodplain;
- is **not** underlain by steeply dipping bedrock;
- does **not** lie in an area that contains ancient landslide debris;
- does **not** lie in a rockfall hazard zone;
- **does** lie within an area considered potentially susceptible to landslides;
- does **not** lie within the city of Colorado Springs Hillside Overlay Zone, and
- does **not** have a history of known landfill activity.

GEOLOGIC CONDITIONS

Our previous *Geologic Hazard Study* is referenced above. We reviewed our previous reports and considered them in the preparation of this validation report. We identified no geologic conditions

that would preclude the development, as currently proposed. The following geologic hazards and constraints that were identified are listed below:

- Expansive Soils and Bedrock
- Hydrocompactive Soils (Moisture Sensitive)
- Unstable or Potentially Unstable Slopes
- Erosion
- Faults and Seismicity
- Seasonal Surface and Subsurface Water
- Mapped Landslide (off-site)
- Radon

For each hazard and constraint, mitigation options were presented. We believe the mitigation options presented in our amended report dated April 2, 2024 are still valid, as reiterated below.

Expansive Soils and Bedrock– constraint

Should unsuitable clay soils or claystone bedrock be encountered beneath foundations, mitigation will be required. The interbedded nature of the soils and bedrock in this site suggests expansive clay could be encountered at various depths across the site. If these materials are encountered, they can readily be mitigated with typical construction practices common to this region of El Paso County, Colorado such as overexcavation and replacement of the unsuitable clays.

The occurrences of potentially expansive soils and bedrock should be identified and dealt with after further investigation of each building site. If appropriate mitigations and/or foundation design adjustments are implemented, the presence of expansive soil is not considered to pose a risk to the proposed structures.

Hydrocompactive Soils (Moisture Sensitive) - constraint

Should hydrocompactive soils be encountered beneath foundations, mitigation will be required. If these materials are encountered, they can readily be mitigated with typical construction practices common to this region of El Paso County, Colorado such as applying additional compactive effort to the soil.

If appropriate mitigations and/or foundation design adjustments are implemented, the presence of hydrocompactive soil is not considered to pose a risk to the proposed structures.

Unstable or Potentially Unstable Slopes - constraint

It is our understanding the steep slopes located outside the boundaries of this development and along the Highway 115 embankment are not to be improved and are to remain undisturbed. Any new cuts or fills should be no steeper than 3:1 without specific slope analysis. Drainage should be directed away from slopes and carried away in a non-erosive manner. Construction should not create areas of

ponded water which can saturate the subsurface materials and create unstable conditions.

Based on the proposed layout by Matrix, structures will be able to maintain a minimum of 30 feet separation from the crest of the steep slopes. If structures are to encroach within 30-feet of the crest of the steep slopes, slope stability analysis should be performed prior to any construction.

Any proposed retaining walls should be properly designed and constructed. Deep cuts are not anticipated, excavations and other subsurface features should not be permitted to become traps for water. Water should not be allowed to flow over the steep slopes but should be intercepted by either drains or ditches and carried safely away.

Erosion - constraint

The silty sand and gravel on site are mildly to moderately susceptible to wind, erosion and moderately to highly susceptible to water erosion. Mass overlot grading is not proposed, but wind erosion and/or associated dust problems should be expected for a short time during construction. If the problem is considered severe, watering of the cut areas may be required to control dust.

The sandy soils were encountered at medium to very dense consistency's and are less susceptible to wind erosion. However, in regards to water erosion, precautions should be made to protect the steep slopes that reside outside the property boundaries of the area within the southwestern portion of the property. These slopes are primarily subject to sheetwash and rill erosion which can eventually lead to concentrated flows of water and gully erosion. Ditch lining materials, small check dams, sediment traps and detention ponds will be required. The determination and location of any ditches, check dams and/or additional special erosion features should be performed in conjunction with the drainage engineer.

Post development, a development maintenance entity should monitor the mitigation measures (e.g. ditch lining materials, small check dams, sediment traps, detention ponds) put in place to protect the off-site steep slopes and verify the mitigation measures continue to properly redirect surface water away from the steep slopes. If signs of new or localized erosion are observed near or on the surface of the steep slopes, they should be promptly corrected and restored to ensure continued stability of the steep slopes.

Provided these recommendations are implemented, the occurrence of erosion will be limited and is not considered to pose a risk to the proposed development.

Faults and Seismicity - hazard

The Pikes Peak Regional Building Code, 2023 Edition, indicates maximum considered earthquake spectral response accelerations of 0.181g for a short period (S_s) and 0.055g for a 1-second period (S_1). Based on the results of our experience

with similar subsurface conditions, and the recommendations provide by ASCE 7 seismic site classification standard, it is recommended the site be classified as Site Class B, with average shear wave velocities ranging from 2,500 to 5,000 feet per second for the materials in the upper 100 feet.

Seasonal Surface and Subsurface Water - constraint

Foundations must have a minimum 30-inch depth for frost protection. Perimeter drains are recommended around portions of the structures which will have habitable or storage space located below the finished ground surface. This includes crawlspace areas but not the walkout trench, if applicable. Perimeter drains are recommended for portions of the structures which will have below-grade spaces to help reduce the intrusion of water into areas below grade. A typical perimeter drain detail is presented in Figure 16.

If groundwater is encountered at the time of the site-specific subsurface soil investigations within 4 to 6 feet of the proposed basement slab elevation, an underslab drain would be considered in conjunction with the perimeter drain. It must be understood that subsurface drains are designed to intercept some types of subsurface moisture and not others. Therefore, the drain(s) could operate properly and not mitigate all moisture problems relating to foundation performance or moisture intrusion into the basement areas.

Mapped Landslide – hazard

Landslides generally occur on steeper slopes. We understand there are slopes within the development that are steep, with isolated slopes ranging up to 60-70 percent. These slopes are generally located along the Highway 115 embankment, along the northern boundary, and along the drainageways. The preliminary plan has taken into account the steep slopes in these areas by setting the buildable areas atop the slope back to the 3:1 setback.

Slope analysis were not completed at the time of the study. It is our opinion that until the grading plans are complete, a slope analysis at this stage would generally not represent the proposed development. In order for the analysis to be accurate, we request to review the grading plans prior to approval to verify the recommended setback is sufficient.

Other than avoidance, it is our opinion that no mitigation measures exist which can feasibly (and cost-effectively) be implemented on a lot-specific basis that would address the global stability of landslides occurring within our outside this development. The risk of reactivation of the landslides outside the property boundaries (either partially or as a whole) or destabilization of localized slopes north and east of the site is a permanent risk to those in the area and one that may be adversely affected by factors outside the control of the owner or resident of the subject property.

The risk of landslides within the development, due to the proposed construction is a risk that developers should be conscious of. The slopes within the property are comprised primarily of silty sand and gravel with cobbles, making them susceptible to water erosion, increasing the risk of surficial movement and/or landslides. As with the proposed buildings, long-term cut and fills should be avoided in the vicinity of the steep slopes unless a slope stability analysis is performed.

We believe the risk of landslide activity within this new proposed development is no greater than the risk on surrounding lots within the same older development. This report represents a review of the Geologic Hazards specific only to the referenced site. Excluded from this report is a review or analysis of the "global" stability of the surrounding areas or an evaluation of the stability of landslides that have previously occurred (or may occur in the future) in the vicinity of this site.

Radon - constraint

Radon hazards are best mitigated at the building design and construction phases. Providing increased ventilation of basements, crawlspaces, creating slightly positive pressures within structures, and sealing of joints and cracks in the foundations and below-grade walls can help mitigate radon hazards. Passive radon mitigation systems are also available.

Based on our review of our previous report and the Development Plan, it is our opinion that the findings and recommendations presented in the referenced *Geologic Hazard Study* are still valid for the currently proposed construction of the proposed development.

CLOSING

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by geotechnical engineers practicing in this or similar localities. RMG does not warrant the work of regulatory agencies or other third parties supplying information which may have been used during the preparation of this report. No warranty, express or implied is made by the preparation of this report. Third parties reviewing this report should draw their own conclusions regarding site conditions and specific construction techniques to be used on this project.

The scope of services for this project does not include, either specifically or by implication, environmental assessment of the site or identification of contaminated or hazardous materials or conditions. Development of recommendations for the mitigation of environmentally related conditions, including but not limited to biological or toxicological issues, are beyond the scope of this report. If the Client desires investigation into the potential for such contamination or conditions, other studies should be undertaken.

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by geotechnical engineers and engineering geologists practicing in this or similar localities. RMG does not warrant the work of regulatory agencies or other third parties supplying information which may have been used during the preparation of this report. No

warranty, express or implied, is made by the preparation of this report. Third parties reviewing this report should draw their own conclusions regarding site conditions and specific construction techniques to be used on this project.

If we can be of further assistance in discussing the contents of this report or analysis of the proposed development, from a geotechnical engineering point-of-view, please feel free to contact us.